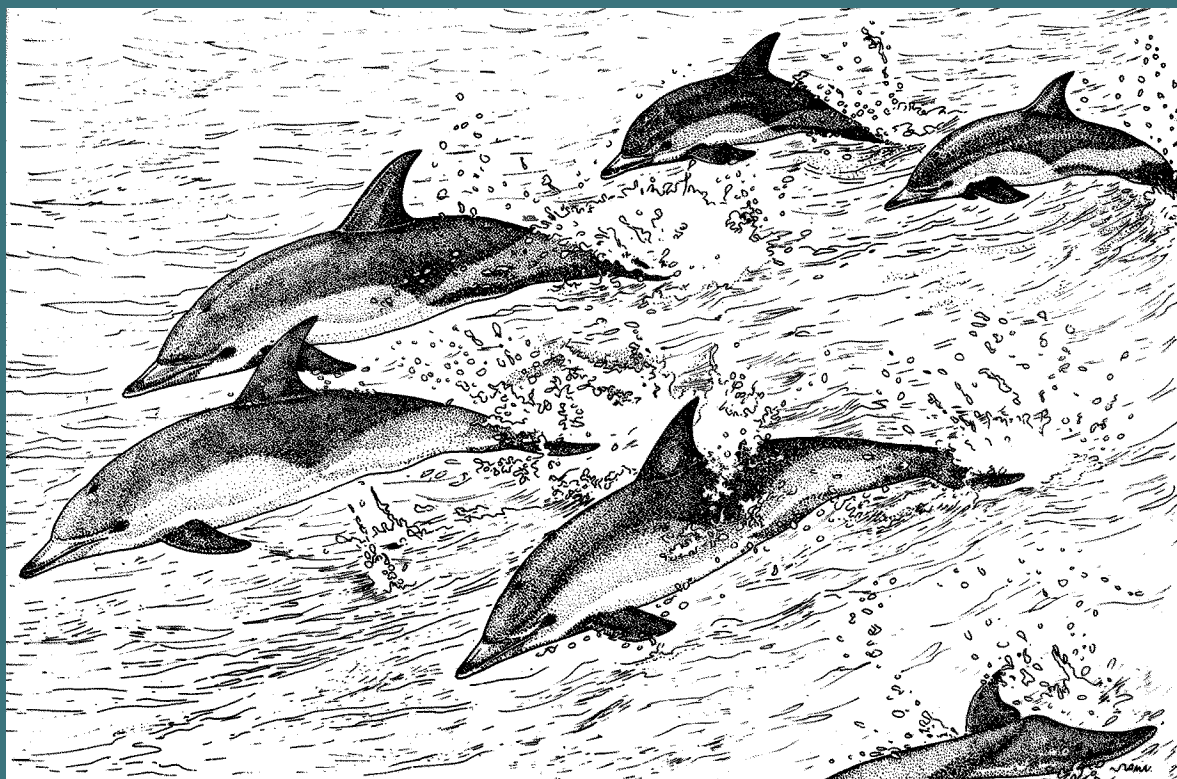




FAO SPECIES IDENTIFICATION GUIDE

# MARINE MAMMALS OF THE WORLD



UNITED NATIONS ENVIRONMENT PROGRAMME

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS



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M-42

ISBN 92-5-103292-0

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FAO SPECIES IDENTIFICATION GUIDE

# MARINE MAMMALS OF THE WORLD

by

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UNITED NATIONS ENVIRONMENT PROGRAMME

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, 1993

## PREPARATION OF THIS DOCUMENT

This identification guide was prepared under the direction of the Species Identification and Data Programme of the Marine Resources Service, Fishery Resources and Environment Division, Fisheries Department, Food and Agriculture Organization of the United Nations (FAO), Rome, Italy. Preparation was supported jointly by the United Nations Environment Programme, Nairobi, Kenya, and the FAO Fisheries Department Regular Programme.

The authors of this document are well known experts in marine mammal taxonomy and biology. They have extensively studied these magnificent creatures both live, in their natural habitat, and as specimens in museums around the world. The illustrator of the main full-body illustrations, Pieter A. Folkens, is also a prominent marine mammal biologist and conservationist. His extensive observations of marine mammals account for the accuracy and usefulness of his illustrations.

The title of this document is slightly misleading since we also included 4 cetacean, 2 seal, and 1 sirenian species that spend all of their lives in freshwater. However, since all other members of these groups are marine, we include the freshwater species for sake of completeness.

The format of this document is different from the 4 kinds of publications normally prepared by the FAO Fisheries Department Species Identification and Data Programme (individual species synopses, world species catalogues of major resource groups, field guides for specific countries or small regions, and identification sheets for major regions of the world). It is intended as a worldwide field guide of a major resource group, with extended coverage of each species, and it therefore superficially resembles our identification sheet series.

Populations of marine mammals have been exploited to near the point of extinction in the past. More recently, marine mammals have become recognized not only as a fisheries resource and as a marketable tourist attraction, but also as an aesthetic resource, integral to the heritage of all mankind. The purpose of this guide is to aid in the management and conservation of this valuable natural resource.

**Technical Editors:** K.E. Carpenter, C. Sommer, A. Bogusch, and A.-L. Agnalt, FAO, Rome.

**Illustrators:** M. D'Antoni, FAO, Rome (skulls, 3 main species figures, and all other line illustrations); P.A. Folkens, Oceanic Society, California (all other main species figures and surface profiles); and P. Lastrico, FAO, Rome (maps).

**Page composition:** A. Bogusch, FAO, Rome.

**Jefferson, T.A., S. Leatherwood, and M.A. Webber**

**FAO species identification guide. Marine mammals of the world.**

Rome, FAO. 1993. 320 p. 587 figs.

### Abstract

This is a worldwide guide for the identification of marine mammals and those cetaceans, seals, and sirenians also found in freshwater. The 119 species include a variety of taxa: baleen whales, toothed whales, dolphins, porpoises, seals, sea lions, sirenians, marine otters, and the polar bear. There is an introduction with notes on marine mammal distribution in regard to oceanography and marine mammal identification, a glossary of technical terms, illustrated keys to species, illustrated family keys for skulls, species sheets, and a table of species by major marine fishing areas. Every species sheet includes scientific and official FAO names, diagnostic features, notes on similar species, size, distribution, biology, habitat, behaviour, exploitation, and IUCN (World Conservation Union, formerly International Union for the Conservation of Nature and Natural Resources) status. The work is fully indexed and includes a list of references and sources for further reading.



## Preface and Acknowledgments

This guidebook summarizes the best information available to us on marine mammal identification through 1993. We did not have the luxury of time to consult all the thousands of original references that contribute to the substantial body of knowledge on these diverse animals. Instead, we took the following approach. First, we compiled much of the information for initial drafts from outstanding recent compilations, supplemented by our knowledge of more recent information. Second, with humble admission that we are not experts on all 119 species covered in this guide, we submitted these drafts to from one to three colleagues per species and revised the text, often substantially, based on their corrections and suggestions (and often their generous contributions of yet unpublished data). Finally, we carefully re-edited the manuscript to eliminate extraneous information and to ensure that what we have included in the species accounts is in a format that facilitates comparison and cross-referencing, both of which are essential in a field guide.

The FAO Species Identification Sheets for Fishery Purposes do not usually contain referents within the text (Bonner and Laws, 1985; di Natale, 1987). However, we acknowledge here our primary sources. For cetaceans, we depended heavily on Leatherwood et al. (1976, 1982, 1988), Leatherwood and Reeves (1983), Ridgway and Harrison (1985, 1989, in press a and b), Martin (1990), and Klinowska (1991). Our primary sources for pinnipeds were Ridgway and Harrison (1981 a, b), King (1983), Riedman (1990a), and Reeves et al. (1992). Finally, information on sirenians, otters, and the polar bear comes largely from Reeves et al. (1992) and Reynolds and Odell (1991). We are particularly grateful to R. R. Reeves and B. S. Stewart for their indulgence of our extensive use of the published version and working drafts of Reeves et al. (1992), which was released just as this manuscript was submitted for publication.

Individual species accounts were reviewed by R. W. Baird, A. Baker, C. S. Baker, K. C. Balcomb III, N. B. Barros, J. Bengston, N. Bonner, M. Borobia, F. Bruemmer, M. M. Bryden, J. Calambokidis, I Christensen, V. G. Cockcroft, C. Cowles, M. Cawthorn, V. da Silva, R. W. Davis, S. Dawson, D. P. Domning, M. Donoghue, F. H. Fay, L. Fleischer, V. Fountree, J. Francis, R. L. Gentry, W. Gilmartin, R. N. P. Goodall, M. P. Heide-Jergensen, G. Heinsohn, J. Horwood, M. A. Iñiquez, T. Kasuya, K. Koracs, S. D. Kraus, S. L. Kruse, A. C. Lescrauweet, J. K. Ling, C. Lockyer, D.M. Lorigne, R. M. Laws, H. Marsh, A. R. Martin, J. G. Mead, M. Marmontel, M. W. Newcomer, D. K. Odell, W. F. Perrin, W. Perryman, M. C. Pinedo, R. L. Pitman, B. Powell, R. Praderi, A. J. Read, R. R. Reeves, S. B. Reilly, J. C. Reyes, D. Robineau, G. J. B. Ross, V. Rowntree, M. D. Scott, R. Sears, D. E. Sergeant, P. Shaughnessy, G. K. Silber, R. K. Sinha, B. Smith, P. J. Stacey, B. S. Stewart, S. L. Swartz, B. Tershy, K. Van Waerebeek, O. Vidal, Wang Ding, R. S. Wells, B. Würsig, and Zhou Kaiya. Assistance in various aspects of manuscript preparation was given by B. E. Curry.

Body illustrations were prepared by P. A. Folkens, and skull and line illustrations were prepared by M. d'Antoni, (FAO) from materials assembled by the authors. D. Robineau provided French common names, **and** A. Aguilar provided them in Spanish. T Sullivan, S. Stuart, and P. Reijnders provided current IUCN status designations for some species. Our editors at FAO, K. Carpenter, C. Sommer, and A.-L. Agnalt, were very helpful in all aspects of the preparation of this guide, and were patient with our missing of deadlines.

We are very grateful to all these colleagues and friends for their generosity and genuinely helpful spirits. Because of their involvement, this manuscript is much improved from our original draft. Any remaining errors and deficiencies are our responsibility.

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## 1. INTRODUCTION AND GENERAL REMARKS

**I**nterest in wildlife in general, and marine mammals in particular, has increased significantly in recent years, both in the general public and in the scientific and management communities. More people than ever are including wildlife watching in their activities, and this includes educational and adventure expeditions to see wild marine mammals up close. At the same time, there is increasing awareness of the integral importance of marine mammals to healthy aquatic ecosystems, and of the growing threats that a variety of human activities pose to these animals and their environments. Research and education programs are seeking to better understand and more clearly communicate the nature of these threats and to recommend appropriate steps to reduce or eliminate their impacts.

Good field guides are integral to all these activities. Although there are guides to limited geographical areas and some subsets of the world's marine mammal fauna, there is as yet no single comprehensive guide that covers all the world's whales, dolphins, porpoises, seals, sea lions, walruses, manatees, dugongs, marine and sea otters, and polar bears. Additionally, few of the existing guides provide aids to identifying live animals, in-hand specimens, and skulls. This field guide, commissioned by the Food and Agriculture Organization of the United Nations and the United Nations Environment Programme, is intended as the first attempt to fill that need.

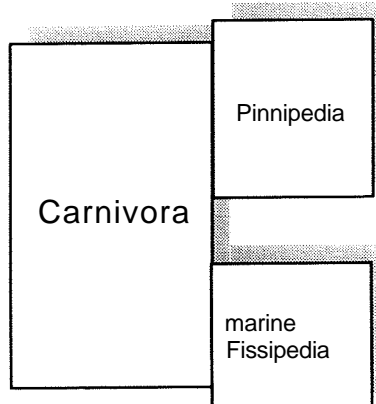
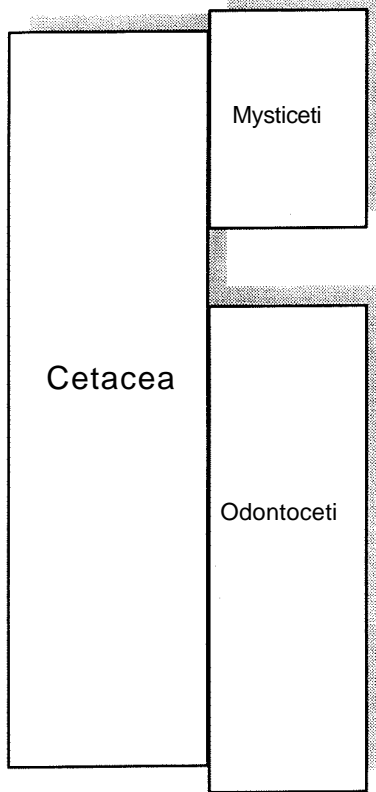
We have attempted to make this volume as complete and comprehensive as possible. However, we are aware that it is limited by the differences in the amount and quality of information available on the various groups, as well as by the inadequacies of our approach towards representing what is available. Therefore, we prefer to think of this as a starting point, to be improved by input from those who use it in the field. Future editions will be modified to correct errors and deficiencies revealed by extensive use. In the mean time, we hope this book helps both amateurs and professionals with the sometimes difficult task of confidently identifying species of marine mammals they see alive or encounter dead.

Most writers use the term 'marine mammal' to include members of 5 different mammalian groups: cetaceans (whales, dolphins, and porpoises), sirenians (manatees and the dugong), pinnipeds (sea lions, the walrus, and seals), marine and sea otters, and the polar bear (Fig. 1). These diverse

groups are currently thought to represent 5 or 6 different recolonizations of the water by land-dwelling ancestors. The term marine mammal, therefore, implies no systematic or taxonomic relationship. In fact, the cetaceans are more closely related to horses, pigs, and zebras than they are to other marine mammals, the pinnipeds have more in common with bears and weasels, and the sirenians are more closely allied to elephants and hyraxes. These differences notwithstanding, however, all marine mammals have one thing in common - they derive all (or most) of their food from marine (or sometimes fresh) water.

All marine mammals have undergone major adaptations, which permit them to live in the water. The cetaceans and sirenians spend their entire lives in the water, while other marine mammals come ashore for various reasons, at particular times in their life cycle (most commonly to reproduce, moult, or rest). Major structural modifications to the bodies of cetaceans, sirenians, and pinnipeds involve the loss of hind limbs (cetaceans and sirenians), the adaptation of limbs for propulsion through water (pinnipeds), and the general streamlining of the body for hydrodynamic efficiency (all 3 groups). Structural modifications to the marine and sea otters and the polar bear by a marine existence are less apparent in body form; these animals still closely resemble their terrestrial counterparts.

Since this is an identification guide, we include information mainly useful for identifying marine mammal species. For more extensive introductions to the biology of mammals in general, see Gould and McKay (1990) and Macdonald (1984). Additional specific details on the biology of marine mammals can be found for cetaceans in Ridgway and Harrison (1981a and b, 1985, 1989), Leatherwood and Reeves (1983), Evans (1987) Harrison and Bryden (1988), and Martin (1990); for pinnipeds in King (1983), Bonner (1990), Riedman (1990a), and Reeves et al. (1992); for sirenians in Reynolds and Odell (1991) and Reeves et al. (1992); for marine and sea otters in Riedman (1990b) and Reeves et al. (1992); and for polar bears in Stirling (1988) and Reeves et al. (1992). In addition to the above references, several recent works contain excellent summaries of some of the threats to marine mammal populations. These are Bonner (1982), Northridge (1984, 1991), Perrin (1989), Klinowska (1991), and Woodley and Lavigne (1991).



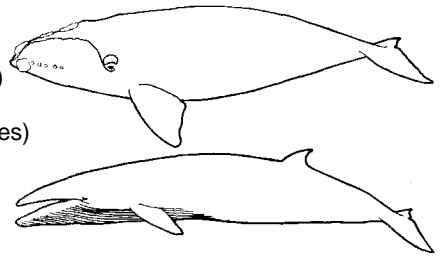
Balaenidae (3 species)

Neobalaenidae (1 species)

Balaenopteridae (6 species)

Eschrichtiidae (1 species)

### Baleen whales



Physeteridae (1 species)

Kogiidae (2 species)

Monodontidae (2 species)

Ziphiidae (19 species)

Delphinidae (32 species)

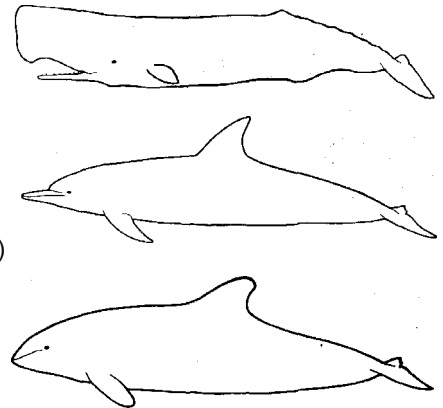
Phocoenidae (6 species)

Platanistidae (2 species)

Iniidae (1 species)

Pontoporiidae (2 species)

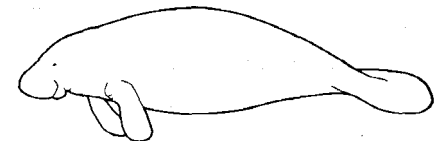
### Toothed whales, dolphins, and porpoises



### Manatees and dugong

Trichechidae (3 species)

Dugongidae (1 species)



### Seals, sea lions, and walrus

Otariidae (14 species)

Odobenidae (1 species)

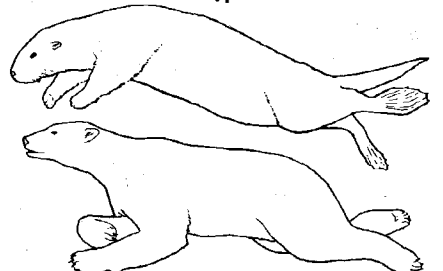
Phocidae (19 species)



### Otters and polar bear

Mustelidae (2 species)

Ursidae (1 species)



ORDER

SUBORDER

FAMILY

Fig. 1 Classification of the Marine Mammals

## 1.1 Oceanography and Marine Mammal Distribution

Marine mammals are not randomly distributed in the world's oceans. It has long been known, for example, that certain species are found exclusively or primarily in waters of a particular depth, temperature range, or oceanographic regime, and not in areas lacking one or all of these characteristics. For most species, however, little is known of the particular factors that cause them to be found in one area and not in another that appears, qualitatively at least, the same.

One major factor affecting productivity, and thus indirectly influencing the distribution of marine mammals, is the pattern of major ocean currents (Fig. 2). These currents are driven largely by prevailing winds, modified in their effects by the "Coriolis Force." Simply stated, the rotation of the earth causes major surface currents to move clockwise in the Northern Hemisphere and counterclockwise in the Southern Hemisphere. This has different implications for animals on east and west sides of ocean basins. In the Northern Hemisphere, warm tropical waters move further north along the east coasts of continental land masses, and warm-water species are often found unexpectedly far north. In the Southern Hemisphere, by contrast, cold polar waters move northward along the west coasts of continents, allowing cold-water marine mammals to range closer to the equator.

The interplay of these surface currents and sub-surface movements of major water masses moves nutrients around by upwelling (the vertical turning over of deep and surface waters) and indrift (the bringing in of nutrients by horizontal currents). As these nutrients and sunlight are the basic ingredients of productivity, areas of high mixing often are

more productive than still areas of little or no mixing. Wherever oceanic conditions promote high nutrient content, it is likely that some species of marine mammal will be present to exploit that richness. Thus, the presence of marine mammals and other high order predators and consumers in an area is related primarily to prey, and secondarily to the water conditions supporting that productivity. Pagophylic (ice-loving) marine mammals are a special case in that their movements are closely tied to the formation and movement of sea ice.

## 1.2 Marine Mammal Identification and How to Use This Guide

Marine mammals can be difficult to identify at sea. Even under ideal conditions, an observer often gets little more than a brief view of a splash, blow, dorsal fin, head, flipper, or back, and this is often at a great distance. Rough weather, glare, fog, or other bad sighting conditions compound the problem. Many species appear similar to another, especially in the brief glimpses typical at sea. Animals of some poorly known groups (most notably beaked whales and Southern Hemisphere fur seals) are especially difficult to identify to species, even with a good look at a live animal or an "in hand" specimen. For all these reasons, even experts often must log a sighting as "unidentified" or on an easily confused pair or group of species. In all cases, this designation, accompanied by a detailed description is preferable to recording an incorrect identification.

The species identification sheets in this guide are designed to be the primary tool used in identifying marine mammals observed at sea. A dichotomous key to marine mammals observed at sea would be virtually worthless, because of the lack of useful

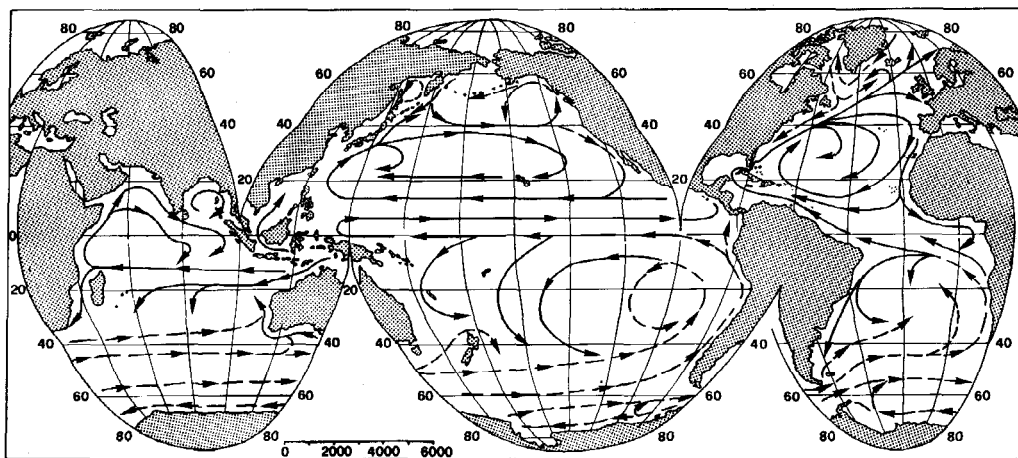


Fig. 2 Major Ocean Currents



cues for most sightings and the variability of marine mammal behaviour. Marine mammal identification at sea is something that must be learned through doing. Experienced marine mammal observers, like birders, often will be able to make an identification based on a composite of characteristic features including behaviour, and personal knowledge of the local marine mammal fauna. This ability will come with experience, guided by working with seasoned observers and the use of a proper field guide.

We must emphasize that the distribution maps presented for each species are approximate. The range limits shown, especially in offshore areas, are often little more than educated guesses, based on limited data and considered in light of available information on the species' distribution and habitat preferences elsewhere. In some cases, the range limits indicated are more a reflection of search effort than of real distribution limits. Therefore, an absence of shading in a certain area does not necessarily mean that the species is not found there.

Available population estimates are also of variable accuracy, and should thus be used cautiously. Techniques for estimating sizes of mammal populations at sea are still evolving and are far from standardized, and available tools have been used unevenly, often with violations of underlying assumptions. For these reasons, the shading on the maps is intended to show only known or postulated range, and not population density.

The status of each species is given in the identification sheets. "Endangered Species Lists" are maintained by both the United States Fish and Wildlife Service (USFWS) (U.S. List of Threatened and Endangered Species) and the International Union for the Conservation of Nature and Natural Resources, now the World Conservation Union (IUCN Red List). In this world guide, we present the IUCN designations. "Endangered" status is assigned to those species considered to be in immediate danger of extinction. Species at risk of soon becoming endangered are listed as "vulnerable." Because of incomplete information and the time lag in completing requirements for listing, these status designations do not always accurately reflect the true status of a species (some species listed as endangered are at no immediate risk; others not listed may be on the verge of extinction). Nevertheless, they are helpful as a warning that plans to exploit a given species must proceed only with great caution.

Marine mammals specimens "in hand" can best be identified by using the dichotomous keys to external features. With such specimens, it may be possible to view the entire body and to measure relative proportions of features. Various features of coloration and morphology are often useful in such

considerations. We have used geographical information as little as possible to separate the species. This will help to avoid biasing observers toward making an identification based on what they think is "supposed" to be there.

Marine mammal skulls can be keyed out using the keys provided at the beginning of each major section. We have assumed that no geographical information is available, so the key can be used to identify an untagged skull of unknown origin in a museum. It is clear from our own work and discussions with colleagues that it is not yet possible to prepare a reliable skull key for the non-specialist. Published keys and related literature are marred with errors and inconsistencies. Skulls of many species are sufficiently similar that it will be necessary to examine a full series of each to define reliable diagnostic features. Until that exercise is completed for each species, it would be a disservice to prepare a key to the species level. Instead, we provide a key only to family level.

It can sometimes be very difficult, or impossible, to identify marine mammals to species, whether based on sightings at sea, specimens "in hand", or an unlabeled skull. Great variability in behaviour, coloration, body morphology, and bone structure can occur. Sometimes it may only be possible to label an animal or group as "unidentified long-snouted dolphin", "unidentified beaked whale," or "unidentified fur seal." If this guide helps lead to an identification in some cases and to narrow down the choices in others, then it will have served an important function.

### 1.3 The FAO Species Codes Included in the Guide

The species codes listed in the species accounts are intended for use by those who need to record catch or sighting data for reporting or database purposes. The 3-letter code is required when reporting statistics to the FAO and are in use by many countries throughout the world. An advantage of these codes is that they are very short but the disadvantage is that they do not contain taxonomic information. The longer code is a taxonomic abbreviation for those who need a short, unique, systematic referent code. It contains in order, abbreviations of the family and genus names and a unique number for each species. The advantage of this is that with practice, taxonomic groups can be recognized from the code. This code is used in a FAO database called SPECIESDAB that contains general biological and fisheries information and will soon be available to interested fisheries workers and conservationists.

## 1.4 Illustrated Glossary of Technical Terms

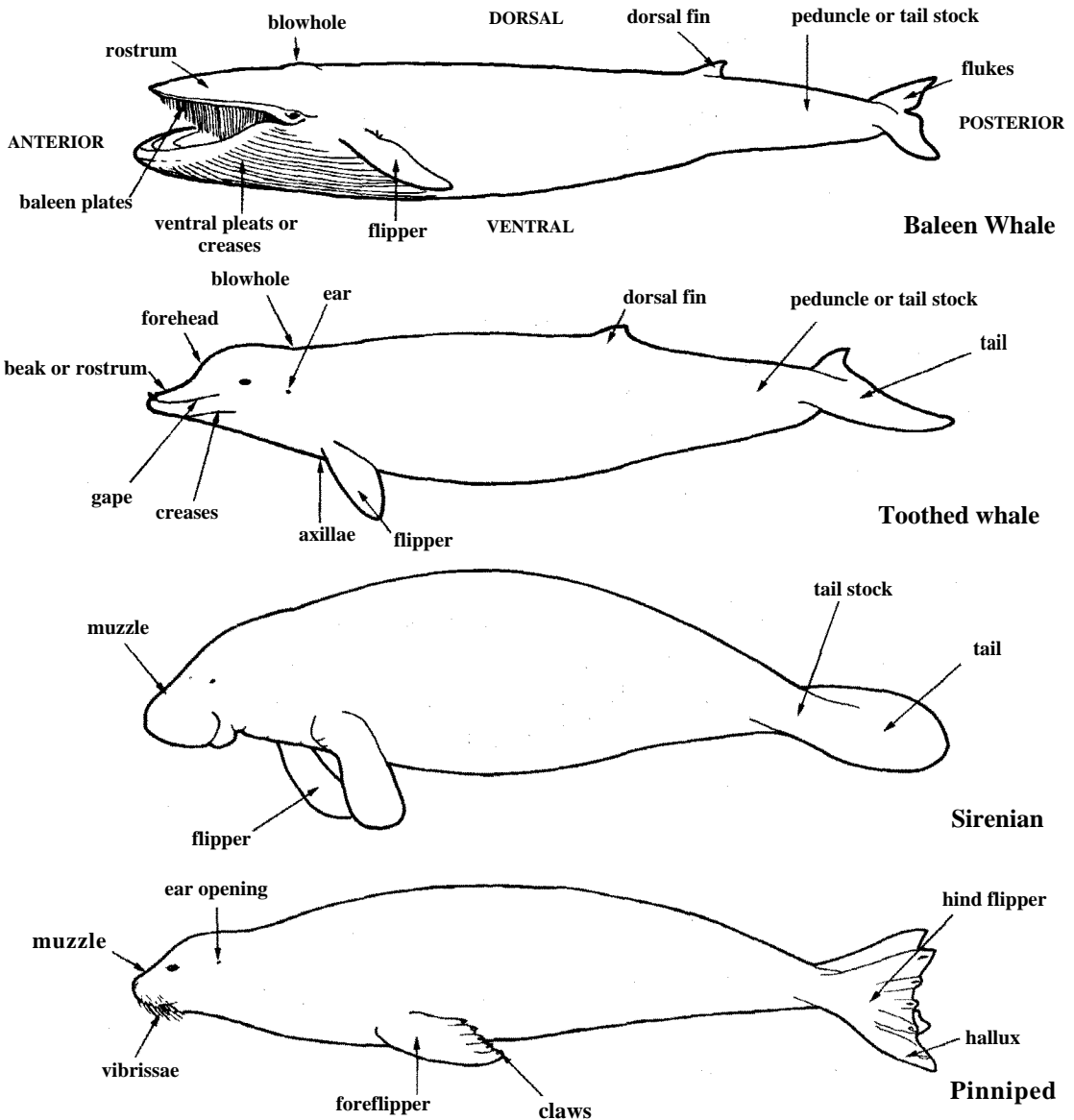


Fig. 3 External Morphology

**Amphipod** - A type of invertebrate that is a food source for some whales.

**Anterior** - Referring to the front (head area) of an animal (Fig. 3).

**Axillae** (singular: axilla) - Armpit, or in the case of marine mammals, "flipperpit" (Fig. 3).

**Baleen** - Plates of keratin hanging from the inside of the upper jaw of mysticetes, used instead of teeth to capture prey (Fig. 3).

**Barnacle** - A type of sessile (mooring) crustacean that is found living on the surface of some marine mammals (Fig. 4).

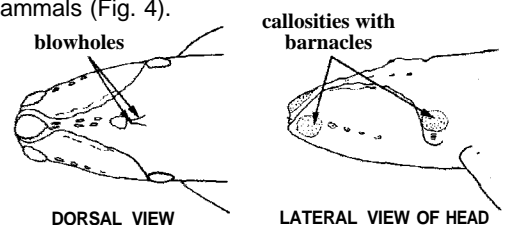
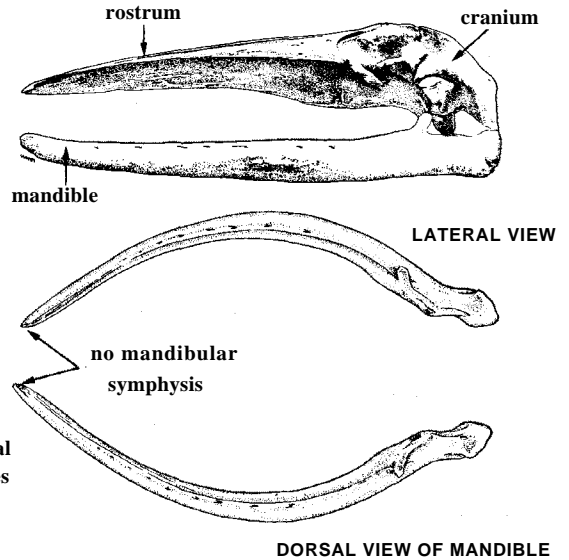
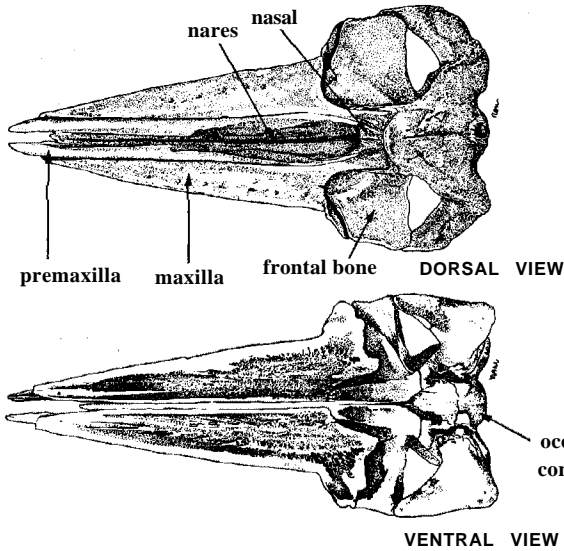
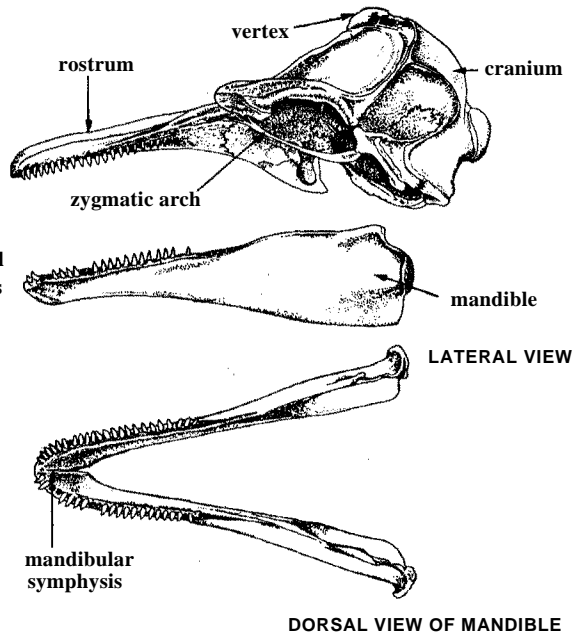
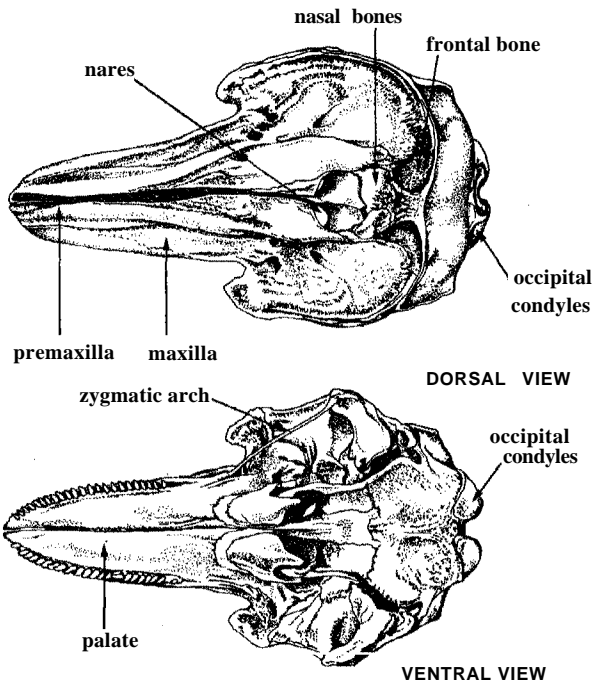


Fig. 4



### Baleen whale



### Toothed whale

**Benthic** - Living on or in the sea floor.

**Blow** - The spout of water vapor exhaled by whales.

**Blowhole(s)** - Nasal opening(s) on the top of the head of cetaceans (Fig. 4).

**Blubber** - The specialized layer of fat just under the skin of most marine mammals.

**Boss** - A raised protruberance on the skull.

**Bowriding** - The act of riding on the pressure wave in front of the bow of a ship.

**Breach** - A complete or nearly-complete leap from the water, resulting in a splash.

**Calf** - A young cetacean or sirenian.

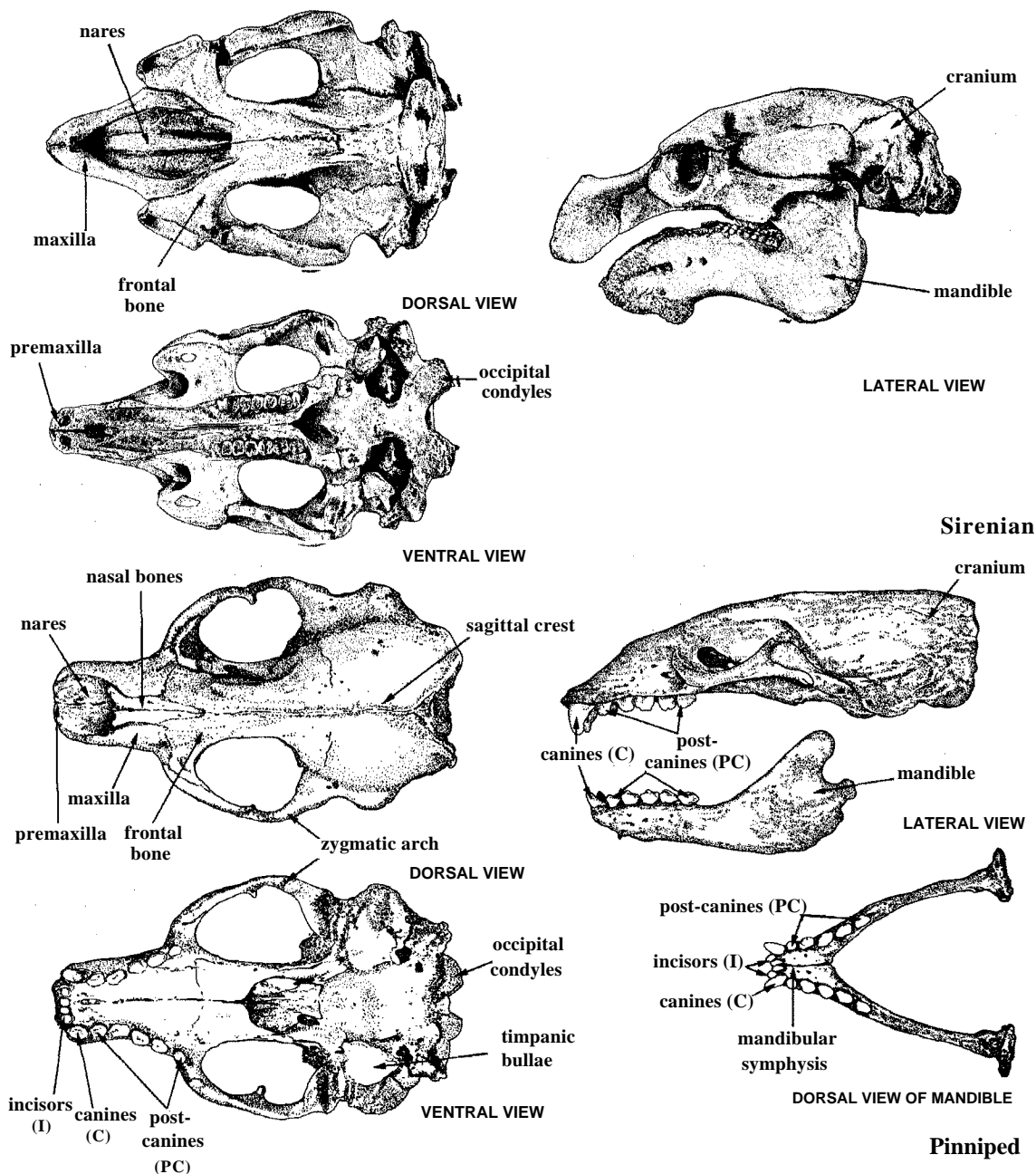


Fig. 5 Morphology of Skulls

**Callosities** - Areas of roughened skin on the heads of right whales, to which whale lice and barnacles attach (Fig. 4).

**Canines** - The set of long, sharp teeth on either side of the front of the upper and lower jaws (abbreviated C in dental formulas) (Fig. 5).

**Cape** - Adarker region on the back of many species of dolphins and small whales, generally with a distinct margin.

**Cephalopod** - A group of invertebrates, including squids and octopuses, fed on by many marine mammals.

**Circumpolar** - Ranging completely around either polar area (i.e., the Antarctic or Arctic).

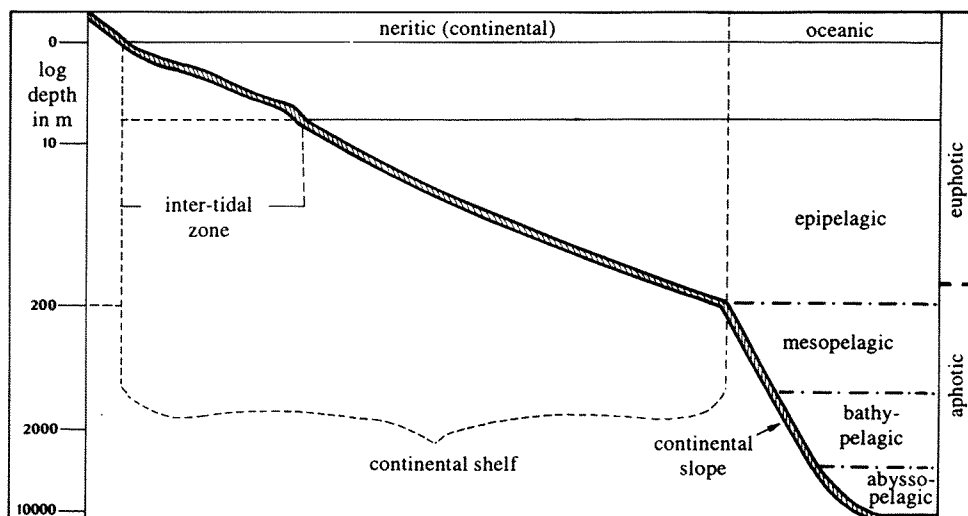


Fig. 6 Profile of the Seabed

**Continental shelf** - The oceanic margin of the continents, characterized by a relatively flat bottom. Generally defined as the benthic area out to 200 m depth (Fig. 6).

**Continental slope** - The oceanic region of steep drop-off just beyond the continental shelf. Generally defined as the benthic area of depths of 200 to 2 000 m (Fig. 6).

**Copepod** - A type of small crustacean fed on by some whales.

**Countershading** - Cryptic coloration with the upper surface dark and the lower surface light.

**Cranium** - The main part of the skull, exclusive of the lower jaw bones (mandibles) (Figs 5 and 7).

**Crustacean** - Member of a class of mostly aquatic invertebrates that are food for many marine mammals.

**Curvilinear length** - Secondary body-length measurement for pinnipeds, taken from the tip of snout to tip of tail along the back, belly, or side (note: not comparable with standard length).

**Deep scattering layer (DSL)** - Adense aggregation of largely light-sensitive aquatic organisms (mostly fish and various invertebrate species) that migrates vertically in the water column each day (towards the surface in darkness and deeper in brightness).

**Dental formula** - Pinnipeds, sirenians, otters, and bears have differentiated teeth represented in a formula in which numbers indicate the quantity of each type of tooth in the upper and lower jaw. The formulas presented in this guide take the following form: Incisors (I) upper/lower, canines (C) upper/lower, post-canines (PC) upper/lower. In otters, bears, and some sirenians, the post-canines are differentiated into premolars (PM) and molars (M).

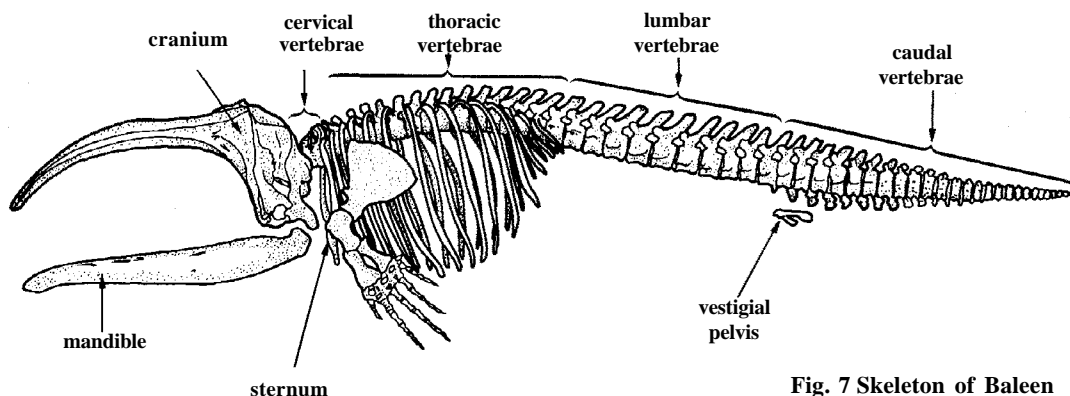


Fig. 7 Skeleton of Baleen

The numbers refer to the number of teeth on each side of the jaw (Fig. 5).

**Demersal** - Found on or near the bottom of the sea.

**Dorsal** - Relating to the upper sur-face of an animal (Fig. 3).

**Dorsal fin** - The structure on the back of most cetaceans (not supported by bone). Some species only have a dorsal hump or ridge, others have no hint of a dorsal structure (Figs 3 and 8).

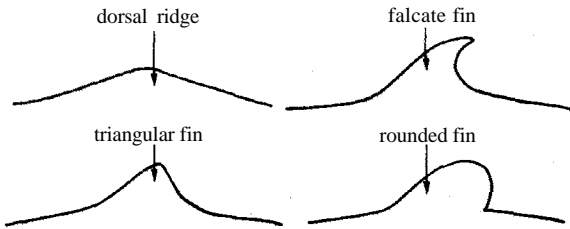


Fig. 8 Dorsal Fins

**Echolocation** - The process of sending out sounds and using the returning echoes to locate objects

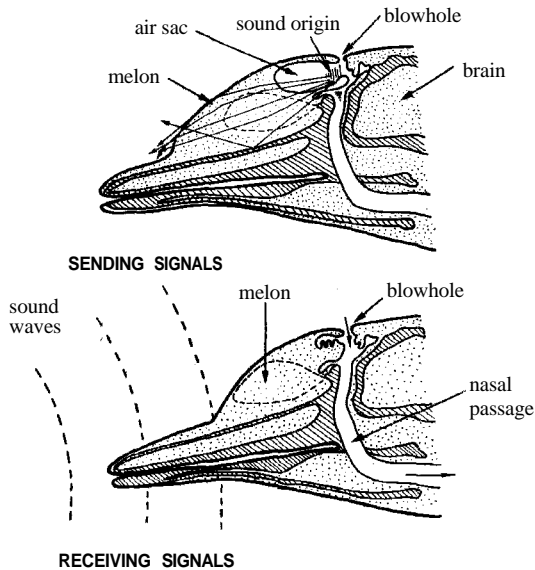


Fig. 9 Organs Associated with Echolocation

**Epipelagic** - Associated with the surface layer of the oceans (< 200 m depth) (Fig. 6).

**Estrus** - The period of sexual receptivity of a female mammal.

**Estuary** - An area partly enclosed by land, where saltwater and freshwater meet.

**Extirpate** - To exterminate a species only from a specific part of its range.

**Extralimital** - Outside the normal limits of an animal's distribution.

**Falcate** - Sickle-shaped and curved toward the tail (Fig. 8).

**Flipper** - Flattened fore- or hindlimb of a marine mammal (supported by bone) (Fig. 3).

**Flukes** - The horizontally flattened and blade-shaped tail of cetaceans or dugongs (not supported by bone)(Fig. 3).

**Fluke-up** - To raise the tail flukes into the air upon diving.

**Foreflipper** - The front flipper of a pinniped (Fig. 3).

**Frontal bone** - The major bone comprising the forehead (Fig. 5).

**Gape** - The corner of the mouth, or the widest opening of the mouth (Fig. 3).

**Guard hairs** - The long, thick, sparse outer layer of hairs of a pinniped or otter (Fig. 10).

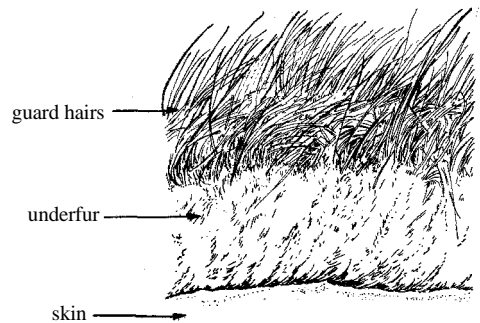


Fig. 10 Structure of Pelt

**Hallux**- Dígit number 1 on the hindflipper of a pinniped (counting from the outside in) (Fig. 3).

**Haul-out** - The act of bringing the body on to land, ice, or other substrate by a pinniped, otter, or very rarely, a sirenian.

**Herd** - A coordinated group of marine mammals (often used synonymously with school for dolphins, and pod for whales).

**Hindflipper** - The rear flipper of a pinniped (Fig. 3).

**Hybrid** - The offspring resulting from a cross between 2 species.

**Incisors** - The front, cutting teeth between the canines (abbreviated I in dental formulas) (Fig. 5).

**Jug handling** - The posture used by most fur seals of lying at the surface with fore- and hindflippers curled into a loop.

**Junk** - The modified melon of sperm whales.

**Krill** - A small shrimp-like crustacean that forms the major food of many baleen whales.

**Lair** - A shelter under snow and/or ice, with an opening to the water, used by some seals.

**Lanugo** - The birth coat of fur of a pinniped (sometimes shed in the uterus).

**Lateral** - Referring to the side of an animal.

**Mandible** - The lower jaw bone (Figs 5 and 7).

**Mane** - A region of long fur around the neck of some male pinnipeds.

**Mass stranding** - A stranding involving 3 or more animals.

**Maxilla** - One of the 2 major bones of the upper jaw (Fig. 5).

**Melon** - The fatty organ in the forehead of toothed whales, believed to be used in echolocation (Fig. 9).

**Mesopelagic** - Associated with the middle layer of the oceans (200 to 1 000 m depth) (Fig. 6).

**Molars** - The grinding teeth at the back of the jaw, which grow only once in life (abbreviated M in dental formulas) (Fig. 5).

**Mollusk** - A type of invertebrate, including clams, squids, and octopuses.

**Moult** - The process of shedding the fur, or the skin and the fur, to be replaced by a new set.

**Monogamy** - A social system in which individuals have only 1 mate per breeding season.

**Monotypic** - A taxonomic group that has only 1 member.

**Muzzle** - The projecting part of the head, including the mouth, nose, and jaws (Fig. 3).

**Mysid** - A shrimp-like invertebrate that is the food of some marine mammals.

**Mystacial area** - The area around the vibrissae, or whiskers, in pinnipeds and otters.

**Nape** - The area of the back of the neck on a pinniped.

**Nares** (singular: naris) - The bony nasal openings of the skull (Fig. 5).

**Nasal bones** - The small bones around the nasal openings of the skull (Fig. 5).

**Neonate** - A newborn

**Occipital condyles** - The rounded areas on the occipital bone of the skull where the vertebral column attaches (Fig. 5).

**Oceanic** - The ocean region past the edge of the continental shelf (generally deeper than 200 m) (Fig. 6).

**Palate** - The roof of the mouth (Fig. 5).

**Pantropical** - Occurring globally around the tropics.

**Parasite** - An organism that obtains a benefit from another organism while causing it harm.

**Peduncle** (caudal) - The laterally compressed region between the dorsal fin and tail flukes of cetaceans and dugongs; a narrow tail stock (Fig. 3).

**Pelage** - Fur (Fig. 10).

**Pelagic** - Inhabiting the water column of the oceans past the inter-tidal zone (Fig. 6).

**Pinnae** (ear) (singular: pinna) - The external ear flaps (Fig. 3).

**Photo-identification** - The method of study of marine mammals using photographs to identify individuals.

**Pod** - A coordinated group of whales.

**Polar** - Relating to the regions near the poles.

**Polygyny** - A social system in which males have more than 1 mate per breeding season.

**Polynya** - An area of open water in sea ice fields coursed by currents.

**Population** - A biological population is a group of interbreeding individuals of the same species, isolated from other such groups.

**Porpoising** - The act of leaping out of the water while moving forward at speed.

**Post-anal hump or keel** - A protruberance of connective tissue just behind the anus of some cetaceans.

**Post-canines** - The set of all undifferentiated teeth behind the canines in pinnipeds (abbreviated PC in dental formulas) (Fig. 5).

**Posterior** - Referring to the rear (tail area) part of an animal (Fig. 3).

**Premaxilla** - One of the 2 major bones of the upper jaw, bearing the incisors in carnivores (Fig. 5).

**Premolars** - The set of bicuspid teeth in front of the molars, which change from juveniles to adults (abbreviated PM in dental formulas) (Fig. 5).

**Proboscis** - A hanging enlargement of the nose.

**Pup** - A young pinniped or otter.

**Rafting** - The act of several individuals lying together at the surface.

**Rookery** - A terrestrial breeding area for pinnipeds.

**Rostrum - Beak or snout.** Also refers to the upper jaw of the skull (Figs 3 and 5).

**Saddle** - A light patch behind the dorsal fin of some cetaceans.

**Sagittal crest** - A bony crest on the top of the skull in some pinnipeds, often resulting in an external bump on the forehead (Fig. 5).

**School** - A coordinated group of cetaceans (often used synonymously with herd for dolphins).

**Sexual dimorphism** - A difference in the appearance of the sexes, generally with males larger than females, often accompanied by differences in body shape.

**Spermaceti** - The oil found in the spermaceti organ of sperm whales.

**Spinal blaze** - A light streaking of color invading the cape below the dorsal fin of some dolphins.

**Spy-hop** - The act of a whale bringing its head vertically out of the water.

**Standard length** - Body length, measured from the tip of the upper jaw to the notch in the fluke (straight line) for cetaceans, and from the snout tip to the end of the tail (straight line, belly up) for pinnipeds.

**Sternum** - The breastbone (Fig. 7).

**Stock** - A biological population, generally defined for management purposes.

**Stranding** - The act of coming on to land, either alive or dead, intentional or accidental, of cetaceans or sirenians.

**Supraorbital processes** - Small bony protruberances above the orbits on the skull (Fig. 5).

**Symphysis** (mandibular) - The coming together of the 2 lower jaw bones (Fig. 5).

**Tail stock** - The region just ahead of the tail, connecting it to the rest of the body (Fig. 3).

**Taxonomy** - The science of classification of organisms using different groupings. From highest to lowest level of organization the groupings of interest to this guide (with examples for the bottlenose dolphin) are: Class (Mammalia), Order (Cetacea), Sub-order (Odontoceti), Family (Delphinidae), Genus (*Tursiops*), and Species (*Tursiops truncatus*).

**Telescoping** - The migration, over the course of evolutionary history, of the cetacean skull bones to form their current configurations, resulting in the placement of the nares on the top of the skull.

**Temperate** - Inhabiting the mid-latitudes characterized by a mild, seasonally changing climate.

**Thorax** - The front or top region of the body, behind the head.

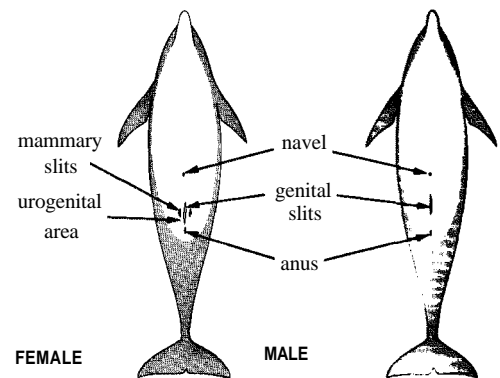
**Throat grooves, creases or furrows** - Short grooves on the throat, characteristic of some groups of whales (Fig. 3).

**Tropical** - Inhabiting the low latitudes characterized by a warm, seasonally stable climate.

**Tympanic bullae** - One of the 2 major inner ear bones of mammals (Fig. 5).

**Underfur** - The short, numerous hairs underlying the guard hairs of pinnipeds and otters (Fig. 10).

**Urogenital area** - The region around the anal and genital slits in cetaceans (Fig. 11).



**Fig. 11 Ventral View of Cetacean**

**Ventral** - Relating to the lower surface of an animal (Fig. 3).

**Ventral pleats** - The long pleats extending from the tip of the jaw to as far back as the navel in some baleen whales (Fig. 3).

**Vertebrae** - The bones of the vertebral column, consisting of 5 sections (cervical, thoracic, lumbar, sacral, and caudal). Some marine mammals do not have true sacral vertebrae (Fig. 7).

**Vestigial** - Existing as a trace of something that is in the process of being evolutionarily lost.

**Vertex** - The elevated portion of the skull immediately behind the bony nares (Fig. 5).

**Vibrissae** - Whiskers (Fig. 3).

**Zygomatic arch** - The bony arch of the cheekbone in marine mammals (Fig. 5).



2. ORDER CETACEA - Whales, Dolphins, and Porpoises

CETACEA

The 78 living species currently recognized in the Order Cetacea are divided into 2 suborders - Odontoceti (toothed whales) and Mysticeti (baleen whales). All representatives of a third suborder, Archaeoceti (ancient whales). are extinct. It is generally agreed that cetaceans are the most derived of all mammals (with the possible exception of bats). Evolved from terrestrial ancestors, they have totally adapted to living in the water, and have no need to come ashore, even for resting or reproduction.

All cetaceans share a similar general body plan: a streamlined (albeit some more-so than others) spindle-shaped torso; flattened paddle-like foreflippers; telescoped skull; nasal openings on top (rather than on the front) of the head; a well-developed blubber layer; internal reproductive organs; newly derived boneless structures in the form of tail flukes and a dorsal fin or ridge (not present in some species); and the loss of such aquatic hindrances as hind limbs (present, if at all, as vestiges), external ear flaps, and fur (although all have hair at some time during their early development and some retain a few rostral hairs for life). Although they may somewhat resemble fish externally, the cetaceans' internal anatomy betrays their terrestrial mammalian ancestry. Their flippers contain reduced counterparts of all or most of the hand and arm bones characteristic of other mammals; pelvic rudiments (and occasionally hind limb remnants) are present. The internal anatomy of cetaceans is surprisingly like that of more familiar land mammals, with such interesting exceptions as the presence of a 3-chambered stomach and cartilaginous reinforcements of the airways all the way down to the alveoli.

2.1 Key to Identification of Cetaceans of the World

- 1a. Double blowhole; no teeth present; baleen plates suspended from upper jaw (Fig. 12) ..... (Baleen whale) → 2
- 1b. Single blowhole; teeth present (though sometimes not protruding from gums); no baleen plates (Fig. 13) ..... (Toothed whale) → 12

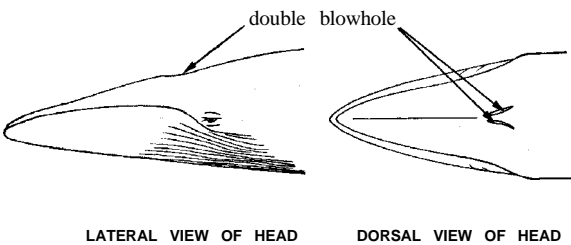


Fig. 12 Baleen whale

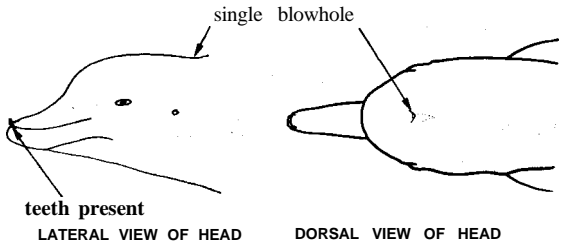


Fig. 13 Toothed whale

- 2a. Long ventral pleats absent (though 2 to 5 short creases or furrows may be found on throat); dorsal fin present or absent; upper jaw relatively arched viewed from the side (Fig.14). ..... → 3
- 2b. Long ventral pleats present; dorsal fin present; upper jaw relatively flat viewed from the side and broad viewed from the top (Fig. 15) ..... (Rorqual) → 5

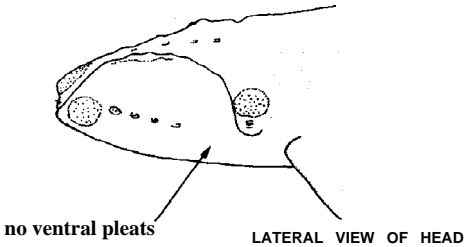


Fig. 14

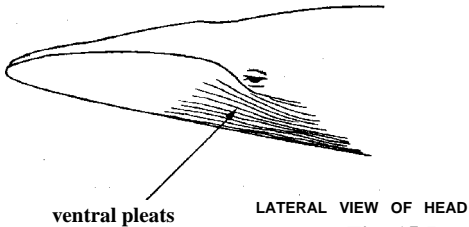


Fig. 15 Rorqual

- 3a. Short creases or furrows on throat 2 to 5; dorsal fin or hump present; upper jaw and mouthline flat to slightly arched; baleen plates short (Fig. 16) .....→ 4
- 3b. No creases on chin or throat; no dorsal fin or hump; upper jaw and mouthline strongly arched viewed from the side and very narrow viewed from the top; long, narrow black baleen plates with fine black fringes (Fig. 17) ..... (Right whale or bowhead whale) → 10

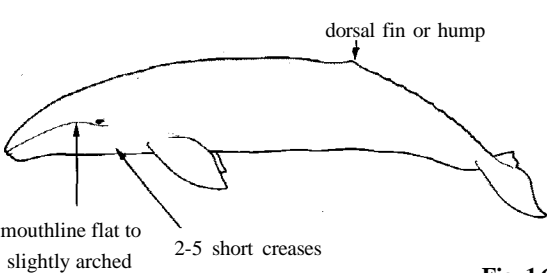


Fig. 16

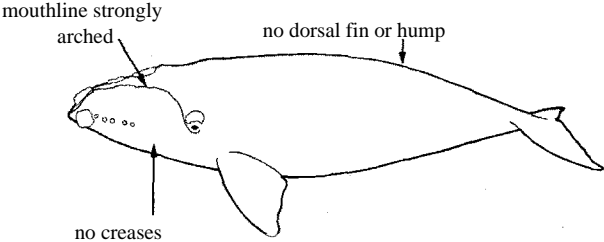


Fig. 17 Right whale or bowhead whale

- 4a. Indistinct creases on throat 2; prominent falcate dorsal fin set about two-thirds of the way back from tip of jaw; upper jaw arched when viewed from side; 210 to 230 yellowish white baleen plates in each side; maximum body length 7 m; Southern Hemisphere distribution only (Fig. 18) ..... **Pygmy right whale (*Caperea marginata*)** p. 48
- 4b. Short furrows on throat 2 to 5; no dorsal fin, but small dorsal hump followed by 6 to 12 crenulations present; mouthline slightly arched; 139 to 180 white to yellowish baleen plates with coarse bristles per side; body mottled grey and usually covered with patches of reddish to yellowish whale lice and grey to white barnacles; maximum body length 15 m; North Pacific distribution only (Fig. 19). .... **Gray whale (*Eschrichtius robustus*)** p. 62

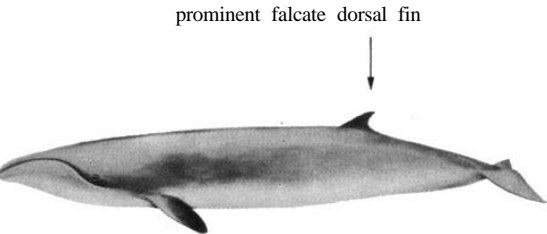


Fig. 18 *Caperea marginata*

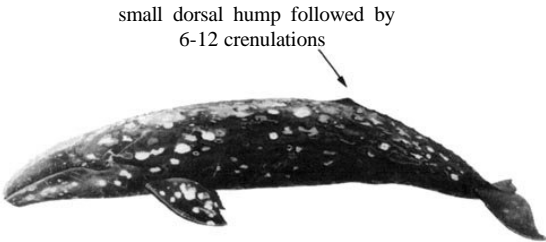


Fig. 19 *Eschrichtius robustus*

- 5a. Ventral pleats end before navel (Fig. 20). .....→ 6
- 5b. Ventral pleats extend to or beyond navel (Fig. 21) .....→ 7

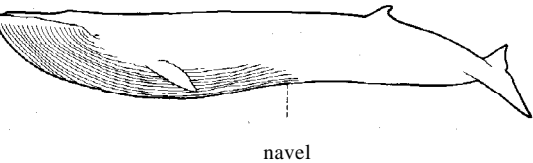


Fig. 20

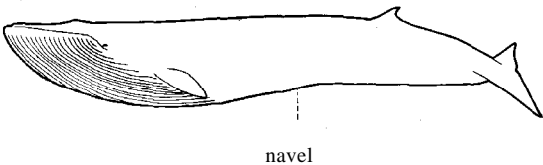


Fig. 21

- 6a. Ventral pleats 30 to 70, longest ending before navel (often ending between flippers); 231 to 360 baleen plates with coarse bristles per side, less than 21 cm long, mostly white or yellowish white (sometimes with dark margin along outer edge); often conspicuous white bands on upper surface of flippers; from above, head sharply pointed; maximum body length 9 m (Fig. 22). . . . . **Minke Whale (*Balaenoptera acutorostrata*)** p. 58
- 6b. Ventral pleats 32 to 60, longest ending past flippers, but well short of navel; 219 to 402 pairs of black baleen plates with many fine whitish bristles, less than 80 cm long; flippers all dark; from side, snout slightly downturned at tip; maximum body length 16 m (Fig. 23) . . . . . **Sei Whale (*Balaenoptera borealis*)** p. 54

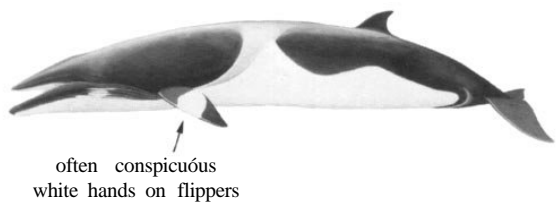


Fig. 22 *Balaenoptera acutorostrata*

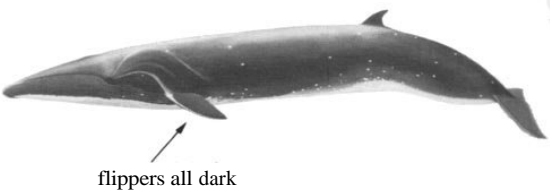


Fig. 23 *Balaenoptera borealis*

- 7a. Flippers one-fourth to one-third of body length, with knobs on leading edge; flukes with irregular trailing edge; less than 35 broad conspicuous ventral pleats, longest extending at least to navel; top of head covered with knobs, 1 prominent cluster of knobs at tip of lower jaw; 270 to 400 black to olive brown baleen plates with grey bristles per side, less than 80 cm long; dorsal fin usually atop a hump; maximum body length 16 m (Fig. 24) . . . . . **Humpback whale (*Megaptera novaeangliae*)** p. 60
- 7b. Flippers less than one-fifth of body length, lacking knobs; flukes with smooth trailing edge; 40 to 100 fine ventral pleats; head lacking knobs; dorsal fin not atop a hump (Fig. 25) . . . . → 8

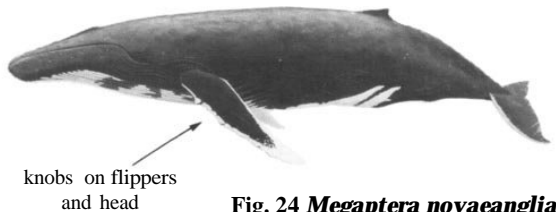


Fig. 24 *Megaptera novaeangliae*

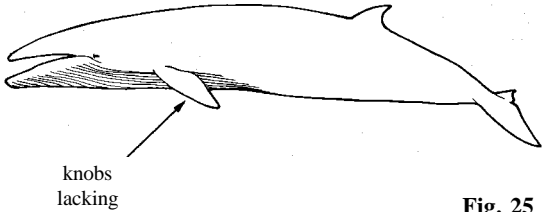


Fig. 25

- 8a. Three conspicuous ridges on snout; 40 to 70 ventral pleats extending to umbilicus; 250 to 370 slate-grey baleen plates per side, with white to light grey fringes; head coloration symmetrical; maximum body length 16 m; tropical and subtropical distribution only (Figs 26 and 27) . . . . . **Bryde's whale (*Balaenoptera edeni*)** p. 56
- 8b. Only 1 prominent ridge on snout; 55 to 100 ventral pleats (Fig. 27) . . . . . → 9

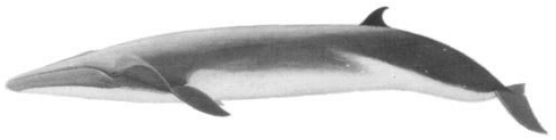
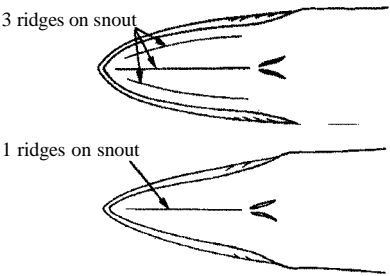


Fig. 26 *Balaenoptera edeni*



DORSAL VIEW OF HEADS

Fig. 27

- 9a. Head broad and almost U-shaped from above; dorsal fin very small (about 1% of body length) and set far back on body; 270 to 395 black baleen plates with black bristles per side (all 3 sides of each plate roughly equal in length); head coloration symmetrical; body mottled grey, with white under flippers; maximum body length 33 m (Fig. 28) ..... **Blue whale (*Balaenoptera musculus*)** p. 50
- 9b. From above, head V-shaped and pointed at tip; dorsal fin about 2.5% of body length; 260 to 480 grey baleen plates with white streaks per side (front one-third of baleen on right side all white); head coloration asymmetrical (left side grey, much of right side white); back dark, with light streaks; belly white; maximum body length 24 m (Fig. 29) ..... **Fin whale (*Balaenoptera physalus*)** p. 52

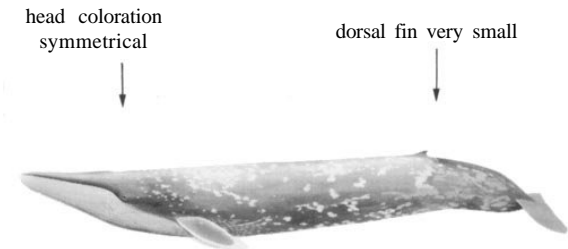


Fig. 28 *Balaenoptera musculus*

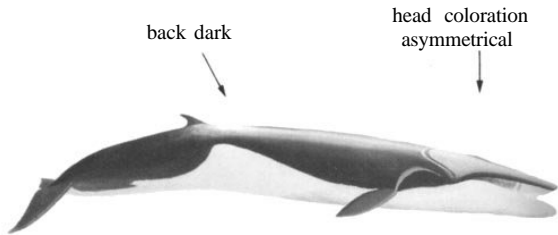


Fig. 29 *Balaenoptera physalus*

- 10b. No callosities; white chin patch and often white band just before flukes; 250 to 350 long (some longer than 4 m) baleen plates per side; maximum body length 20 m; Arctic distribution only (Fig. 30) ..... **Bowhead whale (*Balaena mysticetus*)** p. 46
- 10a. Callosities (roughened areas of skin to which whale lice attach) present on head; 200 to 270 long (up to 2.8 m) baleen plates per side; body black, often with white ventral blotches; maximum body length 17 m; temperate to subarctic distribution (Fig. 31) ... **(Right whale) → 11**

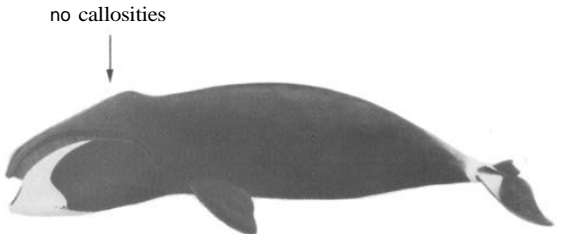
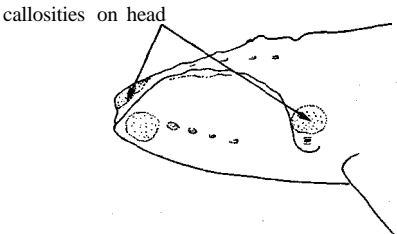


Fig. 30 *Balaena mysticetus*



LATERAL VIEW OF HEAD

Fig. 31 Right whale

- 11a. Northern Hemisphere distribution (Fig. 32) .. **Northern right whale (*Eubalaena glacialis*)** p. 42
- 11b. Southern Hemisphere distribution (Fig. 33) .. **Southern right whale (*Eubalaena australis*)** p. 44

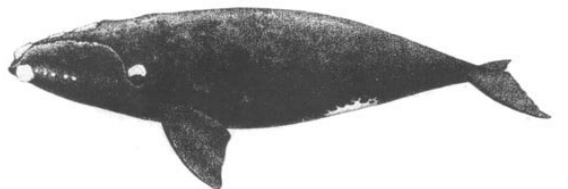


Fig. 32 *Eubalaena glacialis*



Fig. 33 *Eubalaena australis*

- 12a.** Upper jaw extending well past lower jaw; lower jaw very narrow (Fig. 34) .. (**Sperm whale**) → 13
- 12b.** Upper jaw not extending much or at all past lower jaw; lower and upper jaws about same width (Fig. 35). . . . . → 15

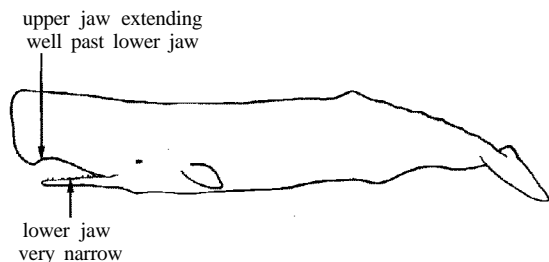


Fig. 34 Sperm whale

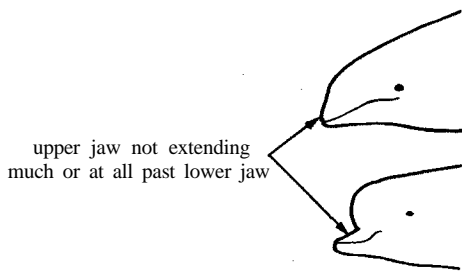
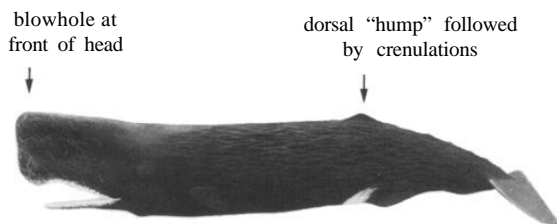
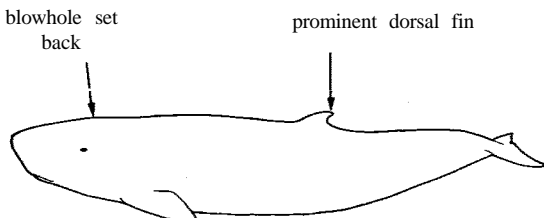
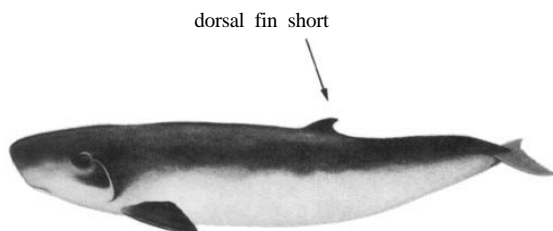
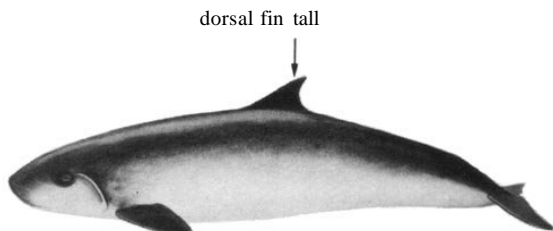


Fig. 35

- 13a.** Body black to charcoal-grey, with white lips and inside of mouth; head squarish and large, 20 to 30% of body length; short creases on throat; S-shaped blowhole at left side of front of head; low, rounded dorsal "hump" followed by a series of crenulations along the midline; 18 to 25 heavy, peg-like teeth in each side of lower jaw, fitting into sockets in upper jaw; body 4 to 18m (Fig. 36) . . . . . **Sperm whale (*Physeter catodon*)** p. 68
- 13b.** Head not more than 15% of body length; blowhole set back from front of head: prominent dorsal fin; 8 to 16 long, thin, sharply pointed teeth in each side of lower jaw, fitting into upper jaw sockets; body less than 4 m (Fig. 37) . . . . .  
 . . . . . (***Kogia* sp.- 2 species generally difficult for non-experts to distinguish**) → 14

Fig. 36 *Physeter catodon*Fig. 37 *Kogia* sp.

- 14a.** Throat creases generally absent; dorsal fin short (< 5% of body length); distance from tip of snout to blowhole greater than 10.3% of total length; 12 to 16 (rarely 10 to 11) sharp teeth in each half of lower jaw; maximum body length 3.4 m (Fig. 38) . . . . .  
 . . . . . **Pygmy sperm whale (*Kogia breviceps*)** p. 70
- 14b.** Inconspicuous throat creases: dorsal fin tall (> 5% of body length); distance from tip of snout to blowhole less than 10.2% of total length; 8 to 11 (rarely up to 13) teeth in each side of lower jaw, sometimes 1 to 3 in each half of upper jaw; maximum body length 2.7 m (Fig. 39) . . . . . **Dwarf sperm whale (*Kogia simus*)** p. 72

Fig. 38 *Kogia breviceps*Fig. 39 *Kogia simus*

- 15a. Two conspkuous creases on throat, forrning a fotward-pointing V; notch between flukes usually absent or indistinct; dorsal fin relatively short and set far back (Fig. 40) (**Beaked whale**) → 16
- 15b. No conspicuous creases on throat; prominent median notch in flukes; dorsal fin usually tall and in middle of back (Fig. 41) ..... (**Dolphin, porpoise, or monodontid**) → 25

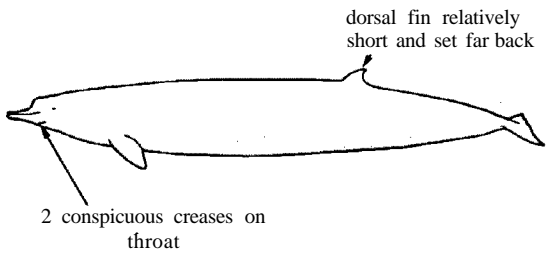


Fig. 40 Beaked whale

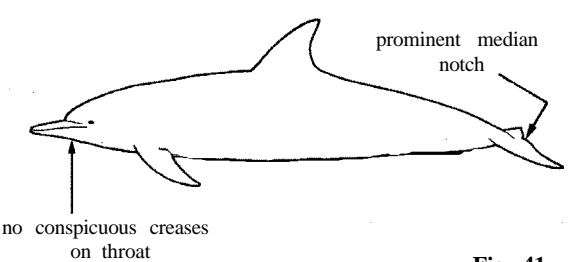


Fig. 41

- 16a. Exposed teeth in both upper and lower jaws (may be inconspicuous or missing in some Gray's beaked whales) ..... → 17
- 16b. Lower jaw only with 1 to 2 pairs of teeth (even these not erupted in many individuals) ... → 18

- 17a. Many teeth in both jaws (17 to 28 per tooth row); pair of tusks at tip of lower jaw that erupt only in males; maximum body length 7 m; Southern Hemisphere distribution only (Fig. 42) ..... **Shepherd's beaked whale (*Tasmacetus shepherdii*)** p. 88

- 17b. Small head; extremely long, narrow beak; white lower jaw and dark grey upper jaw; 2 small triangular teeth well behind tip of lower jaw in males; 17 to 22 pairs of vestigial teeth in upper jaw of both sexes (Fig. 43) ..... **Gray's beaked whale (*Mesoplodon grayi*)** p. 92

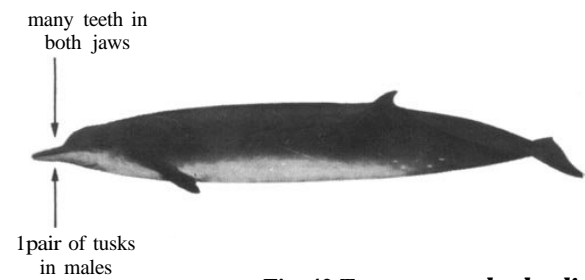


Fig. 42 *Tasmacetus shepherdii*

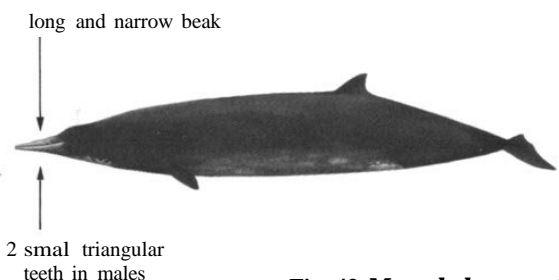


Fig. 43 *Mesoplodon grayi*

- 18a. One or 2 pairs of teeth at or near tip of lower jaw, erupted only in some adults; head either with indistinct beak, or with distinct beak and steep forehead (Fig. 44) ..... → 19
- 18b. Usually 1 pair of teeth well behind tip of lower jaw, erupted only in adult males; small head; prominent beak with forehead rising at shallow angle; sometimes flippers fit into depressions on the body; scratches and scars common on body; maximum body length 6.2 m (Fig. 45) ..... (***Mesoplodon* sp.**) p. 90 → 24

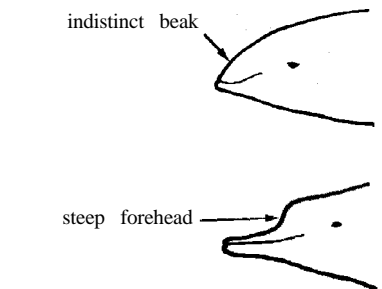


Fig. 44

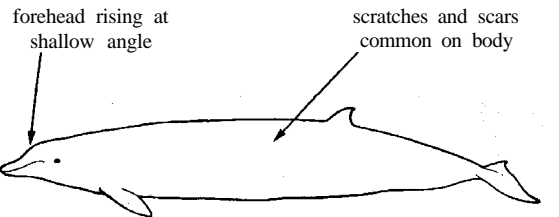


Fig. 45 *Mesoplodon* sp.

- 19a. Two pairs of teeth in lower jaw, 1 pair at tip exposed outside closed mouth, second smaller pair behind first; long tube-like beak; rounded forehead rises from snout at a steep angle) . . . . . (***Berardius* sp.**) → 20
- 19b. One pair of teeth at tip of lower jaw (exposed only in adult males); short or indistinct beak . . . → 21
  
- 20a. Maximum body length 13 m; Northern Hemisphere distribution only (Fig. 46) . . . . . **Baird's beaked whale (*Berardius bairdii*)** p. 78
- 20b. Maximum body length 11 m; Southern Hemisphere distribution only (Fig. 47) . . . . . **Arnoux's beaked whale (*Berardius arnuxii*)** p. 80



Fig. 46 *Berardius bairdii*



Fig. 47 *Berardius arnuxii*

- 21a. Beak indistinct; head small relative to body size; forehead slightly concave in front of blowhole; single pair of teeth directed forward and upward at tip of lower jaw (exposed only in adult males); mouthline upturned at gape; head light coloured; maximum body length 7.5 m (Fig. 48) . . . . . **Cuvier's beaked whale (*Ziphius cavirostris*)** p. 82
- 21b. Tube-like beak distinct; pronounced bulge to steep forehead; tall, pointed dorsal fin; maximum length 10 m (Fig. 49). . . . . **(Bottlenose whale)** → 22

beak indistinct



Fig. 48 *Ziphius cavirostris*

distinct tube-like beak

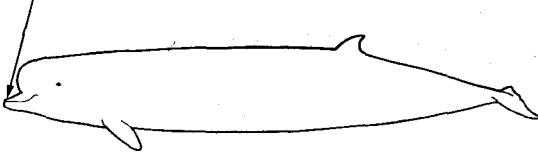


Fig. 49 Bottlenose whale

- 22a. Southern Hemisphere distribution only (Fig. 50) . . . . . **Southern bottlenose whale (*Hyperoodon planifrons*)** p. 86
- 22b. Northern Hemisphere distribution. . . . . 23



Fig. 50 *Hyperoodon planifrons*

- 23a. Cold temperate to subpolar; north Atlantic distribution only (Fig. 51) . . . . . **Northern bottlenose whale (*Hyperoodon ampullatus*)** p. 84
- 23b. Warm temperate to tropical North Pacific, Indian, and Atlantic otean distribution . . . . . ***Hyperoodon* sp. (unidentified)** p. 87



Fig. 51 *Hyperoodon ampullatus*

- 24. The species of the genus ***Mesoplodon*** are generally poorly known. External morphology and pigmentation patterns have not been properly described for most of them, and it is generally not possible for non-experts to identify whales of this genus to species. Even for experts, examination of skulls may be required to identify all but mature males.
- 24a. Moderate beak, not sharply demarcated from forehead; males with white “cap” or “beanie” in front of blowhole; adult males with large flattened tusk in the middle of each side of lower jaw, protruding above upper jaw when mouth is closed; known from North Pacific only (females and subadults require museum preparation for identification) . . . . . **Hubbs’ beaked whale (*Mesoplodon carlhubbsi*)** p. 98
- 24b. Uniformly dark beak; in adult males, tusks near middle of lower jaw barely breaking gumline; known from the Pacific and Indian oceans only (females and subadults require museum preparation for identification) . . **Ginkgo-toothed beaked whale (*Mesoplodon ginkgodens*)** p. 94
- 24c. White markings on beak and forehead absent; lower jaw usually light in colour; tusks of males very large, located on bony prominences near corners of mouth, and oriented slightly forward; lower jaw massive (particularly in adult males), with high arching contour; forehead has concavity in front of blowhole (females and subadults require museum preparation for identification) . . . . . **Blainville’s beaked whale (*Mesoplodon densirostris*)** p. 90
- 24d. Flattened tusks of adult males’ near tip of lower jaw (females and subadults require museum preparation for identification) . . **Hector’s beaked whale (*Mesoplodon hectori*)** p. 96
- 24e. Small (maximum length about 4 m); dorsal fin small, triangular, and rounded at tip; colour dark grey above, fading to lighter below; small egg-shaped teeth located on prominences near the middle of the lower jaw in adult males; known only from eastern Pacific (females and subadults require museum preparation for identification) . . . . . **Pygmy beaked whale (*Mesoplodon peruvianus*)** p. 100
- 24f. External appearance unknown; 2 teeth at tip of lower jaw of males point forward and are oval in cross-section (specimens require museum preparation for identification) . . . . . **Longman’s beaked whale (*Mesoplodon pacificus*)** p. 112
- 24g. Pair of small oval teeth at tip of lowerjaw of adult males; body grey with dark areas around eyes (females and subadults require museum preparation for identification) . . . . . **True’s beaked whale (*Mesoplodon mirus*)** p. 106
- 24h. Two small flattened teeth near front of lower jaw of males; body dark grey above, light grey below; known only from Atlantic Ocean (females and subadults require museum preparation for identification) . . . . . **Gervais’ beaked whale (*Mesoplodon europaeus*)** p. 104



- 24i. White areas in head and neck area; 2 large flattened tusks at top of arch in lower jaw of adult males (protruding above upper jaw when mouth closed); known only from North Pacific Ocean, apparently most common in subarctic waters of Alaska (females and subadults require museum preparation for identification) ..... **Stejneger's beaked whale (*Mesoplodon stejnegeri*)** p. 114
- 24j. Adult males with white jaws and tusks on slightly raised prominences in middle of jaw; known only from Australia, New Zealand, and Kerguelen Island (females and subadults require museum preparation for identification) ..... **Andrews' beaked whale (*Mesoplodon bowdoini*)** p. 110
- 24k. Complex pattern of black, white, and grey; adult males with pair of tusks that grow outside of mouth from lower jaw, and wrap around upper jaw, preventing it from opening more than a few centimetres; known only from Southern Hemisphere (females and subadults require museum preparation for identification) ..... **Strap-toothed whale (*Mesoplodon layardii*)** p. 108
- 24l. Grey with lighter sides and belly; teeth of adult males protrude outside mouth in middle of lower jaw; vestigial teeth sometimes present in both jaws; known only from the temperate and subarctic North Atlantic (females and subadults require museum preparation for identification) ..... **Sowerby's beaked whale (*Mesoplodon bidens*)** p. 102
- 24m. Black with white swathe running from head down sides, or brown in colour; head flat; moderately long beak; trailing edge of dorsal fin nearly straight; known only from eastern tropical Pacific. .... ***Mesoplodon* sp. "A" (unidentified)** p. 116
- 25a. Teeth blunt with expanded crowns, laterally compressed, and relatively small; beak extremely short or nonexistent (Fig. 52) ..... **(Porpoise)** → 26
- 25b. Teeth conical and sharply pointed, unless heavily worn (in cross-section, circular or oval); beak usually present (Fig. 53) ..... **(Dolphin or small toothed whale)** → 31

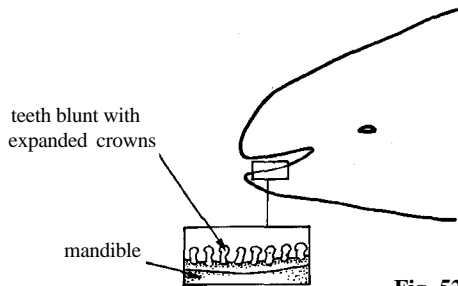


Fig. 52 Porpoise

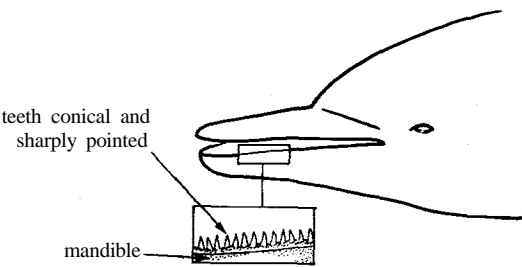


Fig. 53 Dolphin

- 26a. No dorsal fin; narrow dorsal ridge; body dark grey or black, with lighter belly; 13 to 22 teeth in each tooth row; maximum size to 2 m; distribution limited to the Indo-Pacific area (Fig. 54). .... **Finless porpoise (*Neophocaena phocaenoides*)** p. 192
- 26b. Dorsal fin present (Fig. 55) ..... → 27

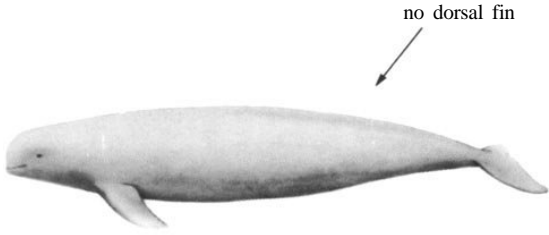


Fig. 54 *Neophocaena phocaenoides*

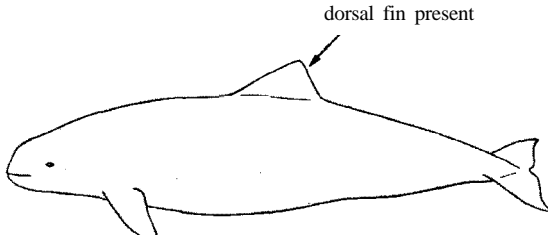
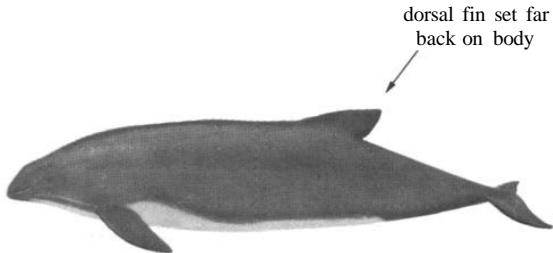


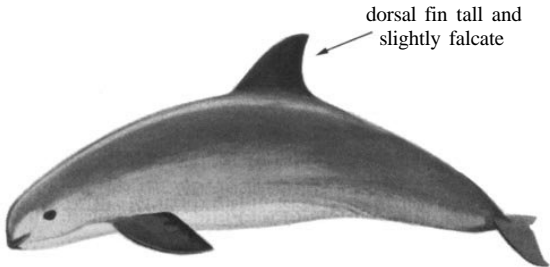
Fig. 55 Porpoise

- 27a. Dorsal fin set far back on body, rising at a shallow angle from back, with long leading edge and convex trailing edge; body dark charcoal grey to black; 11 to 16 pairs of teeth in upper jaw, 16 to 19 in lower; maximum size to 2 m; distribution limited to coastal South America (Fig. 56). . . . . **Burmeister's porpoise (*Phocoena spinipinnis*) p. 188**
- 27b. Dorsal fin upright and set near middle of back . . . . . → 28



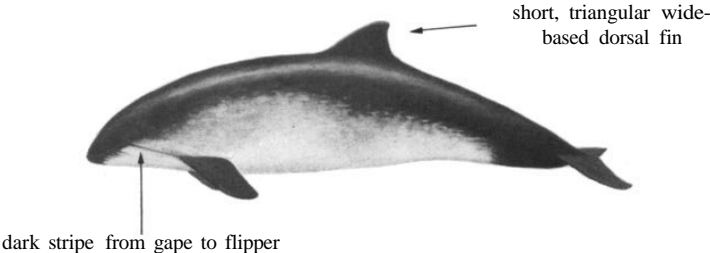
**Fig. 56 *Phocoena spinipinnis***

- 28a. Dorsal fin tall and slightly falcate; body grey to brownish grey, with light belly, dark lip patches, and eye rings; flippers large; 16 to 22 teeth per side of each jaw; maximum size 1.7 m; distribution limited to the Gulf of California, Mexico (Fig. 57). . . . . **Vaquita (*Phocoena sinus*) p. 190**
- 28b. Triangular dorsal fin; found outside the Gulf of California . . . . . → 29



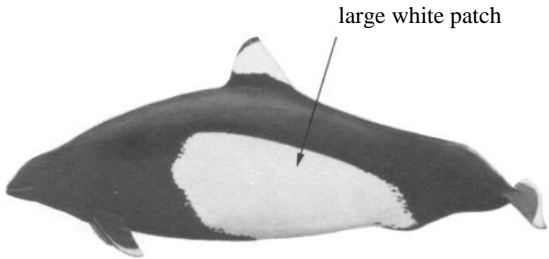
**Fig. 57 *Phocoena sinus***

- 29a. Body dark grey on back to white below; dark stripe from gape to flipper; short, triangular, wide-based dorsal fin; 22 to 28 pairs of teeth in upper jaw, 21 to 25 in lower; maximum size to about 2 m; Northern Hemisphere distribution only (Fig. 58) . . . . . **Harbour porpoise (*Phocoena phocoena*) p. 186**
- 29b. Colour pattern sharply demarcated black and white . . . . . → 30

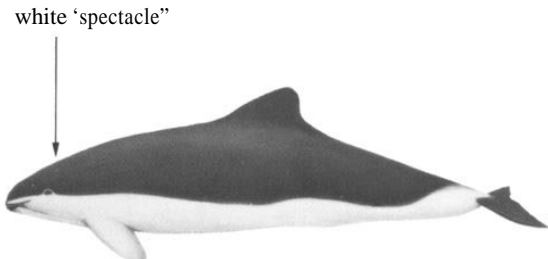


**Fig. 58 *Phocoena phocoena***

- 30a.** Black body with striking large white patch on sides and belly; extremely robust, with small head and appendages; deepened caudal peduncle; dorsal fin triangular, with recutved tip; white or light grey trim on dorsal fin and flukes; 23 to 28 pairs of extremely small teeth per jaw; maximum size to 2.4 m; North Pacific distribution only (Fig. 59) . . . . . **Dall's porpoise (*Phocoenoides dalli*)** p. 182
- 30b.** Body bicoloured, black on dorsal haif and white on ventral haif; black lips; white "spectacle" surrounding eye; dorsal fin triangular; 17 to 23 pairs of teeth in upper jaw, 16 to 20 in lower; maximum size to about 2.2 m; distributed oniy around southern South America and offshore islands of the Southern Hemisphere (Fig. 60) . . . . . **Spectacled porpoise (*Australophocaena dioptrica*)** p. 184

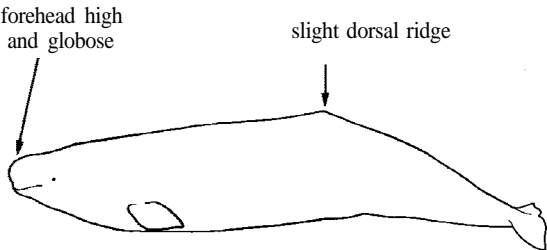


**Fig. 59 *Phocoenoides dalli***

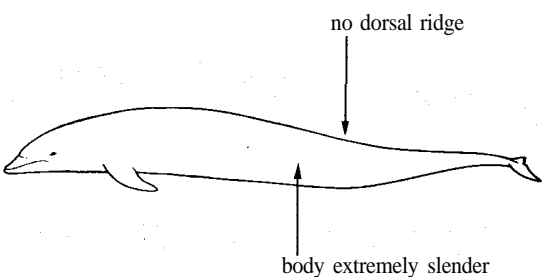


**Fig. 60 *Australophocaena dioptrica***

- 31a.** No dorsal fin or prominent dorsal ridge (there may be a slight dorsal ridge) (Figs 61 and 62) . . . . . **32**
- 31b.** Dorsal fin or prominent dorsal ridge present (Figs 67 and 68) . . . . . **→ 35**
- 32a.** Siight dorsal ridge present, sometimes marked with nicks or cuts; body robust; jaws short and wide; forehead high and giobose; fiippers short, broad, and rounded; distribution limited to arctic and subarctic areas (Fig. 61) . . . . . **(*Monodontid*)** **→ 33**
- 32b.** No dorsal ridge present; body extremely slender; small fiippers and flukes; beak short but distinct (Fig. 62) . . . . . **(*Right whale dolphin*)** **→ 34**



**Fig. 61 *Monodontid***



**Fig. 62 *Right whale dolphin***

- 33a.

Body grey to brownish grey, mottled; short flippers often upturned at tips; flukes with more or less convex trailing edge; only 2 teeth in upper jaw, unerupted except in adult males, in which the left tooth develops into a left-spiraled tusk up to 3 m long; maximum size up to 5 m (excluding tusk); distribution limited to high Arctic (Fig. 63) . . . . .

Narwhal (*Monodon monoceros*) p. 74
- 33b.

Body white to dark grey; extremely stocky; melon bulbous; beak short; head and appendages small; “meck” often visible; 9 pairs of teeth in upper jaw, 8 in lower; maximum size 5.5 m (Fig. 64) . . . . .

White whale (*Delphinapterus leucas*) p. 76

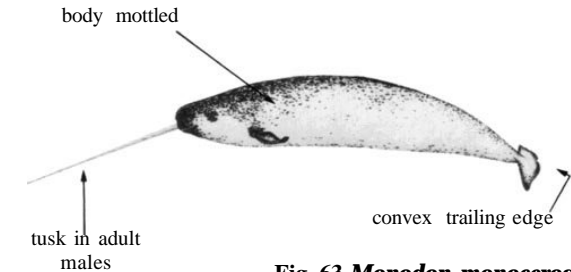


Fig. 63 *Monodon monoceros*

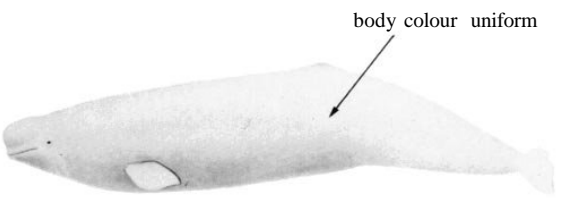


Fig. 64 *Delphinapterus leucas*

- 34a.

Body black with white lanceolate pattern on belly; 37 to 54 fine pointed teeth per side of each jaw; maximum body length 3.1 m; North Pacific distribution only (Fig. 65) . . . . .

Northern right whale dolphin (*Lissodelphis borealis*) p. 170
- 34b.

Body black above and white below; flippers, beak, and forehead mostly white; 44 to 49 teeth in each tooth row; maximum size to 3 m; Southern Hemisphere distribution only (Fig. 66). . . . .

Southern right whale dolphin (*Lissodelphis peronii*) p. 172



Fig. 65 *Lissodelphis borealis*



Fig. 66 *Lissodelphis peronii*

- 35a.

Jaws extremely long; flippers broad and more or less triangular; eyes small; low, broad-based dorsal fin or dorsal ridge; distributed in rivers and lakes, only rarely in estuaries (Fig. 67) . . . . .

(River dolphin) → 36
- 35b.

Prominent dorsal fin; distribution estuarine or marine (Fig. 68) . . . . .

→ 39

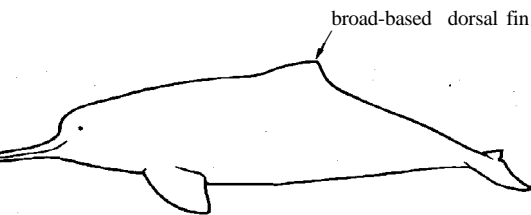


Fig. 67 River dolphin

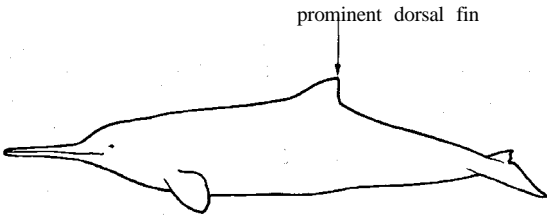
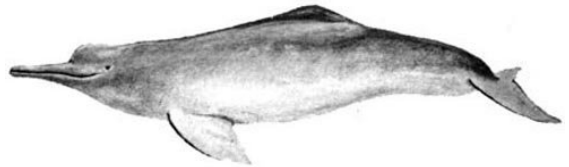
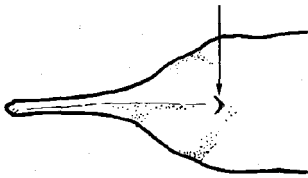


Fig. 68

- 36a.** Blowhole transverse and crescentic; body grey with pinkish cast; dorsal hump low and set two-thirds of the way from the snout tip; forehead steep; 23 to 35 teeth per tooth row; maximum size to 2.6 m; distribution limited to Amazon and Orinoco drainage basins of Brazil, Bolivia, Peru, Colombia, Ecuador, Guyana, and Venezuela (Fig. 69). . . . . **Boto (*Inia geoffrensis*) p. 198**

- 36b.** Blowhole longitudinal (Figs 70 and 71) . . . . . → 37

blowhole transverse and  
crescentic

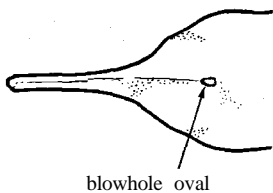


**Fig. 69 *Inia geoffrensis***

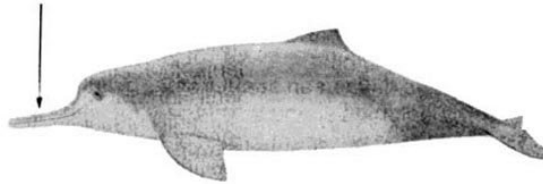
- 37a.** Body bluish grey above and white below; blowhole oval; beak upturned at tip; dorsal fin triangular with blunt tip; 31 to 38 teeth per tooth row; maximum size to 2.6 m; distribution limited to the Yangtze River of China (Fig. 70) . . . . . **Baiji (*Lipotes vexillifer*) p. 200**

- 37b.** Body grey with lighter or pinkish belly; blowhole slit-like; eyes extremely small; beak long, narrow when viewed from above, with interlocking teeth protruding outside closed mouth at front half; low dorsal ridge; 26 to 39 teeth in each row; maximum size to 2.5 m (Fig. 71) . . . . . **(*Platanista* sp.) → 38**

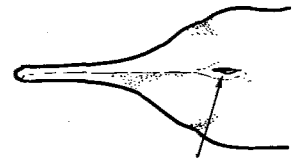
beak upturned at tip



blowhole oval



**Fig. 70 *Lipotes vexillifer***



blowhole slit-like

**Fig. 71 *Platanista* sp.**

- 38a.** Distribution limited to the Ganges and Brahmaputra River systems of India, Nepal, Bangladesh, and Bhutan (Fig. 72) . . . . . **Ganges River dolphin (*Platanista gangetica*) p. 194**

- 38b.** Distribution limited to the Indus River system of Pakistan . . . . . **Indus River dolphin (*Platanista minor*) p. 196**



**Fig. 72 *Platanista gangetica***

- 39a. Body dark grey with lighter belly; prominent triangular dorsal fin with rounded tip; flippers broad with curved leading edge and serrated trailing edge; eyes small; 51 to 58 teeth per tooth row; maximum size to 1.8 m; distribution limited to coastal and estuarine waters of Argentina, Uruguay, and Brazil (Fig. 73) . . . . . **Franciscana. (*Pontoporia blainvillei*)** p. 202
- 39b. Flippers without serrated trailing edge; eyes not particularly small . . . . . → 40



Fig. 73 *Pontoporia blainvillei*

- 40a. Head blunt with no prominent beak (Fig. 74) . . . . . → 41
- 40b. Head with prominent beak (Fig. 75) . . . . . → 52

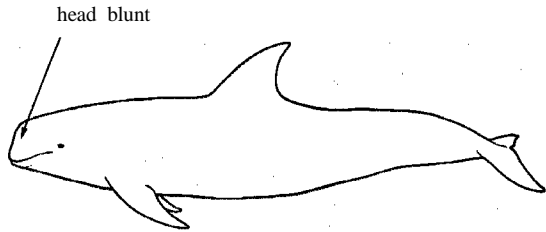


Fig. 74

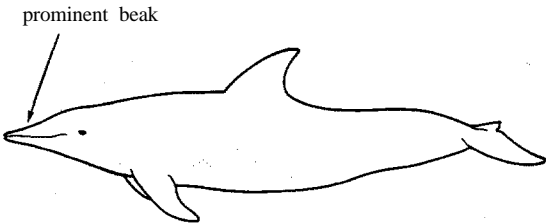


Fig. 75

- 41a. Two to 7 pairs of teeth at front of lower jaw only (rarely 1 to 2 pairs in upper jaw), but teeth may be absent or extensively worn; forehead blunt with vertical crease; dorsal fin tall and dark; body grey to white, covered with scratches and splotches in adults; flippers long and sickle-shaped; maximum body length 4 m (Fig. 76) . **Risso's dolphin (*Grampus griseus*)** p. 152
- 41b. Teeth (7 or more pairs) in both upper and lower jaws; forehead without vertical median crease (Fig.77) . . . . . → 42

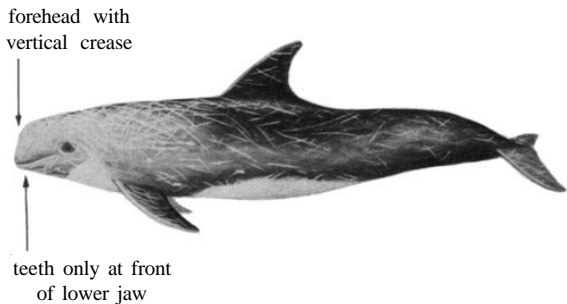


Fig. 76 *Grampus griseus*

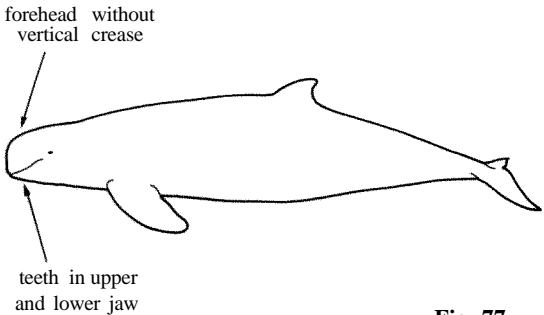


Fig. 77

- 42a. Flippers broad and paddle-shaped with rounded tips (Fig. 78) . . . . . → 43
- 42b. Flippers long and slender with pointed or blunt tips (Fig. 79) . . . . . → 48

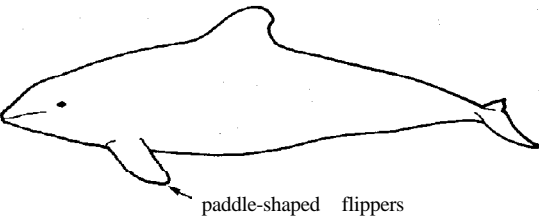


Fig. 78

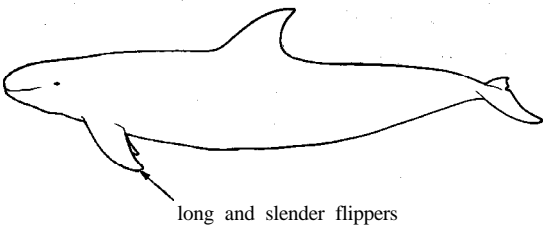


Fig. 79

- 43a. Flippers large and paddle-shaped; dorsal fin tall and erect (up to 0.9 m in females and 1.8 m in males); striking black and white coloration, with white post-ocular patches, white lower jaw, white ventrolateral field, and light grey saddle patch behind dorsal fin; 10 to 12 large (to 2.5 cm in diameter) oval teeth in each tooth row; maximum body length 10 m (Fig.80). . . . . **Killer whale (*Orcinus orca*) p. 120**
- 43b. Dorsal fin low and rounded or triangular: adults less than 3 m; greater than 12 teeth per toothrow. . . . . → 44

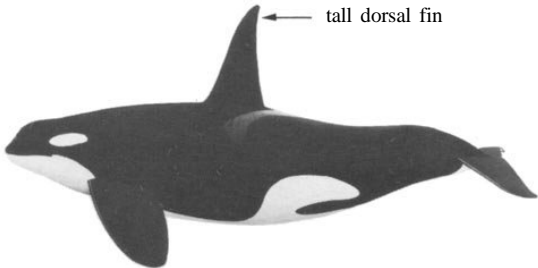


Fig. 80 *Orcinus orca*

- 44a. Body grey with lighter belly: dorsal fin small and slightly falcate; neck crease present; forehead bluff: 15 to 20 teeth per row; maximum size 2.8 m; distribution limited to coastal areas and rivers of southeast Asia and northern Australia (Fig. 81) . . . . . **Irrawaddy dolphin (*Orcaella brevirostris*) p. 118**
- 44b. More than 22 teeth per tooth row . . . . . (*Cephalorhynchus* sp.) → 45

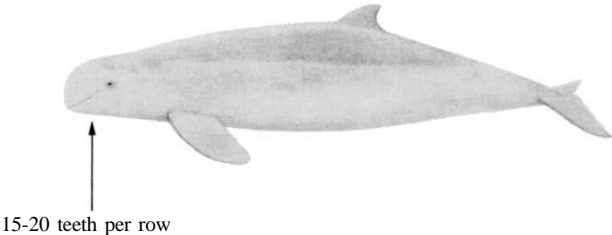


Fig. 81 *Orcaella brevirostris*

45a. Sides light grey; dark grey cape (very narrow just behind blowhole area); belly white, with arms that surround the urogenital area and extend up both sides; white throat patch; white axillary patches; dorsal fin moderately tall and triangular; 22 to 28 teeth in each row; maximum size 1.7 m; distribution limited to southwest coast of Africa (Fig. 82) . . . . . **Heaviside's dolphin (*Cephalorhynchus heavisidii*)** p. 176

45b. Dorsal fin rounded (Fig. 83). . . . . → 46

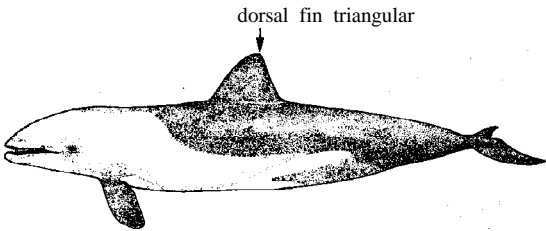


Fig. 82 *Cephalorhynchus heavisidii*

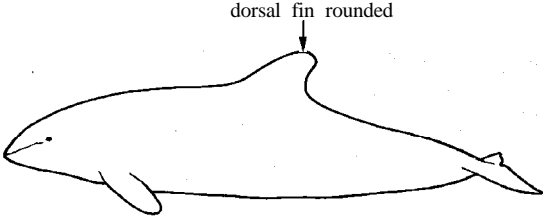


Fig. 83

46a. Distinct black and white colour pattern, with black head and flippers, and black from the dorsal fin to the flukes; white chin patch; black genital patch; 28 to 34 teeth per row; maximum size 1.8 m; distribution limited to coastal and inshore waters of southeast South America and the Kerguelen Islands (Fig. 84) . . . . . **Commerson's dolphin (*Cephalorhynchus commersonii*)** p. 174

46b. Colour pattern largely various shades of grey. . . . . → 47

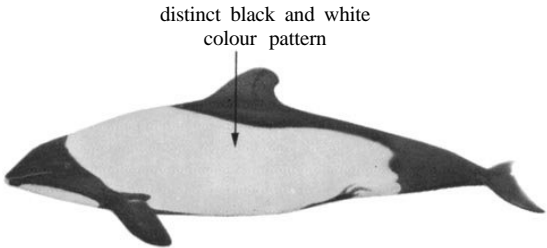


Fig. 84 *Cephalorhynchus commersonii*

47a. Body mostly grey, with white belly and "arms" that extend up the sides on the tail stock (clearly demarcated by a dark grey line), and black dorsal fin, flippers, flukes, face, beak tip, and blowhole area; 26 to 32 teeth per row; maximum size to 1.7 m; distribution limited to coast of New Zealand (Fig. 85) . . . . . **Hector's dolphin (*Cephalorhynchus hectori*)** p. 178

47b. Body grey with clearly demarcated white belly and chin; dark band between the flippers; white spots in axillae; 29 to 34 teeth in each row; maximum size to 1.7 m; distribution limited to west coast of South America, especially protected inshore waters of southern Chile (Fig. 86) . . . . . **Black dolphin (*Cephalorhynchus eutropia*)** p. 180

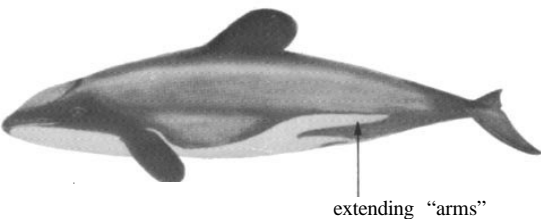


Fig. 85 *Cephalorhynchus hectori*

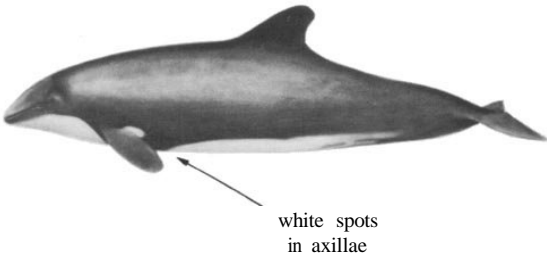
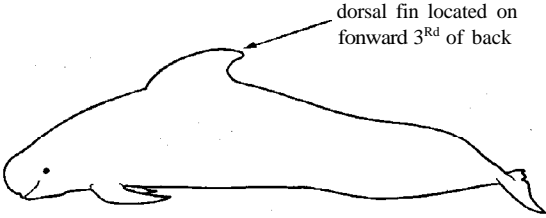


Fig. 86 *Cephalorhynchus eutropia*

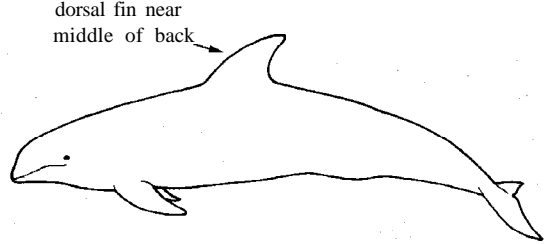


**48a.** Dorsal fin low and broad-based, located on forward third of back; head bulbous; body black to dark grey with light anchor-shaped patch on belly and often light grey saddle behind dorsal fin; often a light streak above and behind each eye; deepened tail stock; long sickle-shaped flippers; 7 to 13 pairs of teeth in front half only of each jaw (Fig. 87) ..... **(Pilot whale) → 49**

**48b.** Dorsal fin near middle of back (Fig. 88). ..... **→ 50**



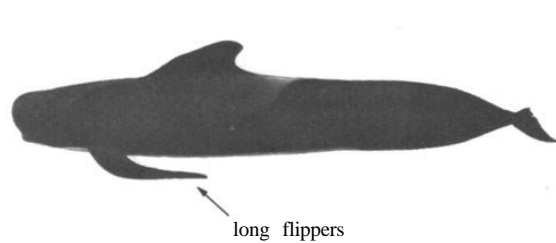
**Fig. 87 Pilot whale**



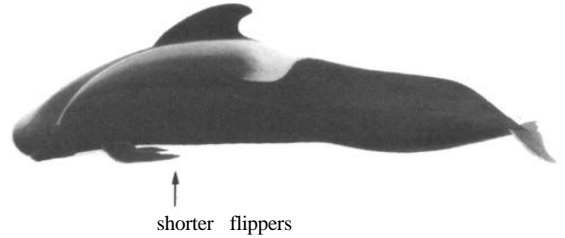
**Fig. 88**

**49a.** Flipper length 18 to 27% of body length, with prominent “elbow”; 8 to 13 teeth in each tooth row; maximum size to 6.3 m; distribution limited mostly to cold temperate regions of North Atlantic and Southern Hemisphere (Fig. 89). **Long-finned pilot whale (*Globicephala melas*) p. 122**

**49b.** Flipper length 16 to 22% of body length; 7 to 9 pairs of teeth in each tooth row; maximum body length 6.1 m; distribution limited to tropical and warm temperate waters (Fig. 90) ..... **Short-finned pilot whale (*Globicephala macrorhynchus*) p. 124**



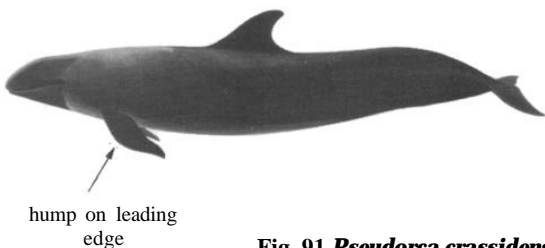
**Fig. 89 *Globicephala melas***



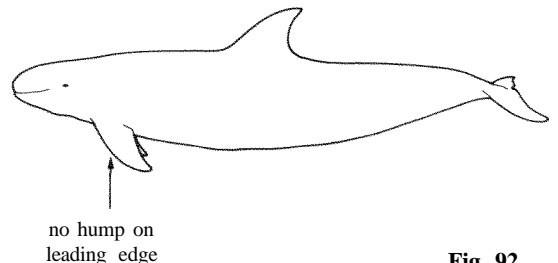
**Fig. 90 *Globicephala macrorhynchus***

**50a.** Flipper with distinct hump on leading edge; body predominantly black; no beak; 7 to 12 large teeth in each half of both jaws, circular in cross-section; maximum body length 6 m (Fig. 91) ..... **False killer whale (*Pseudorca crassidens*) p. 126**

**50b.** Body black or dark grey with white lips; white to light grey patch on belly; flipper lacks hump on leading edge; 8 to 25 teeth in each tooth row (Fig. 92) ..... **→ 51**



**Fig. 91 *Pseudorca crassidens***



**Fig. 92**

- 51a. Less than 15 teeth in each half of both jaws; flippers slightly rounded at tip; distinct dorsal cape; head rounded from above and side: maximum body length 2.6 m (Fig. 93) . . . . .  
Pygmy killer whale (*Feresa attenuata*) p. 128
- 51b. More than 15 teeth per side of each jaw; flippers sharply pointed at tip; face often has triangular dark mask; faint cape that dips low below dorsal fin; head triangular from above; extremely short, indistinct beak may be present in younger animals; maximum body length 2.75 m (Fig. 94) . . . . .  
Melon-headed whale (*Peponocephala electra*) p. 130

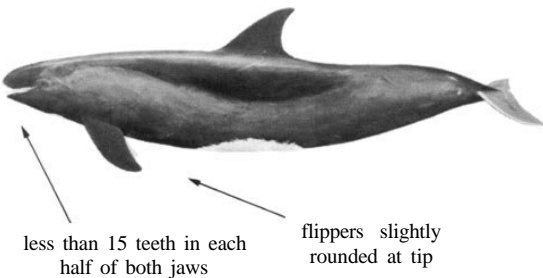


Fig. 93 *Feresa attenuata*

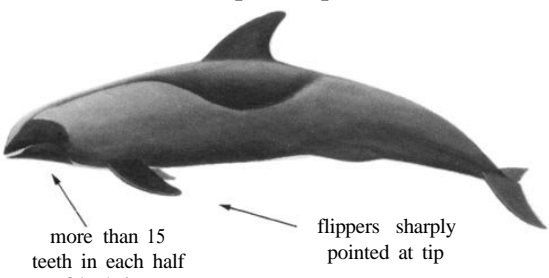


Fig. 94 *Peponocephala electra*

- 52a. Head long and conical; beak runs smoothly into forehead, with no crease; body dark grey to black above and white below, with many scratches and splotches; narrow dorsal cape; flippers very large; 20 to 27 slightly wrinkled teeth in each half of both jaws; maximum body length 2.8 m (Fig. 95) . . . . .  
Rough-toothed dolphin (*Steno bredanensis*) p. 138
- 52b. Beak distinct from forehead (however, there may not be a prominent crease between beak and melon) (Fig. 96) . . . . . → 53

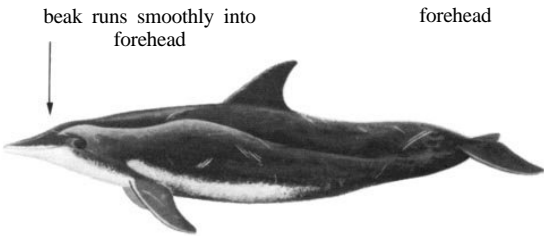


Fig. 95 *Steno bredanensis*

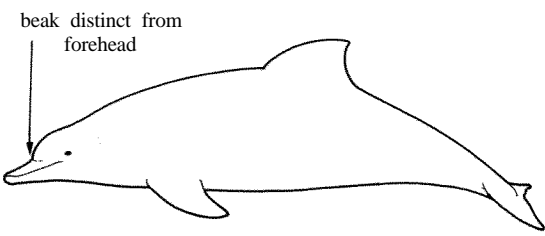


Fig. 96

- 53a. Beak very short and well-defined (less than 2.5% of body length); body stocky (Fig. 97). . . → 54
- 53b. Beak moderate to long (greater than 3% of body length) (Fig. 98) . . . . . → 60

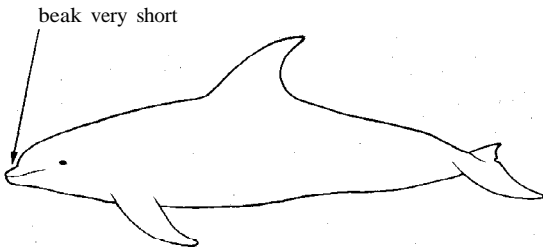


Fig. 97

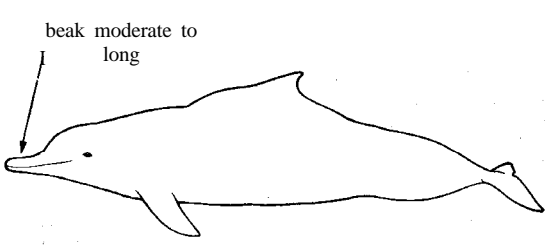


Fig. 98

- 54a. Flippers, flukes, and dorsal fin small; broad dark stripe from eye to anus area (muted in some animals); dorsal fin slightly recurved and uniformly dark; extremely short, but well-defined beak; grooves on palate; 38 to 44 teeth in each side of each jaw; maximum length at least 2.6 m (Fig. 99) ..... **Fraser's dolphin (*Lagenodelphis hosei*)** p. 168
- 54b. Dorsal fin large; no palatal grooves ..... (***Lagenorhynchus* sp.**) → 55

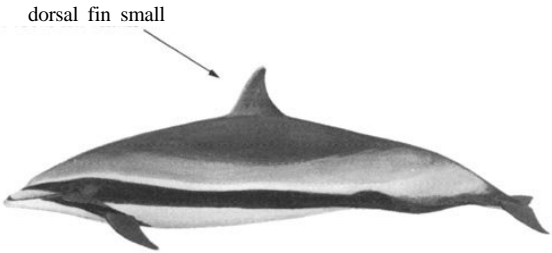


Fig. 99 *Lagenodelphis hosei*

- 55a. Body sharply demarcated black and white, with distinct white hourglass pattern on side, and white belly; dorsal fin strongly falcate; about 28 teeth in each row; maximum size to 2 m; distribution limited to colder waters of circumpolar Antarctic currents (Fig. 100) ..  
..... **Hourglass dolphin (*Lagenorhynchus cruciger*)** p. 148
- 55b. Colour pattern complex with light grey patches on sides ..... → 56

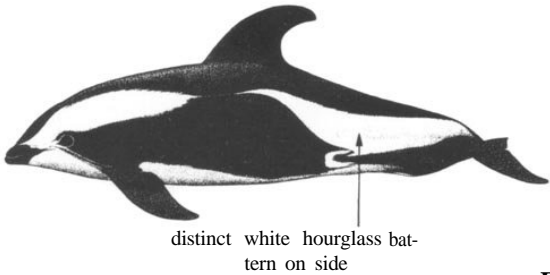


Fig. 100 *Lagenorhynchus cruciger*

- 56a. Body mostly black to dark grey, with white to light grey patches on the sides, and white belly and beak; dorsal fin large and falcate; 22 to 27 teeth in each row; maximum size to 3.5 m; distribution limited to cold waters of North Atlantic (Fig. 101) ..  
..... **White-beaked dolphin (*Lagenorhynchus albirostris*)** p. 144
- 56b. Prominent light grey flank. .... → 57

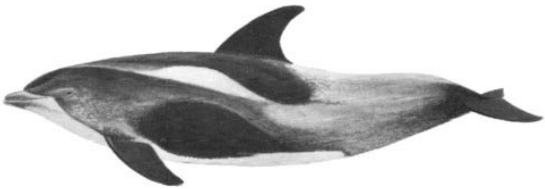
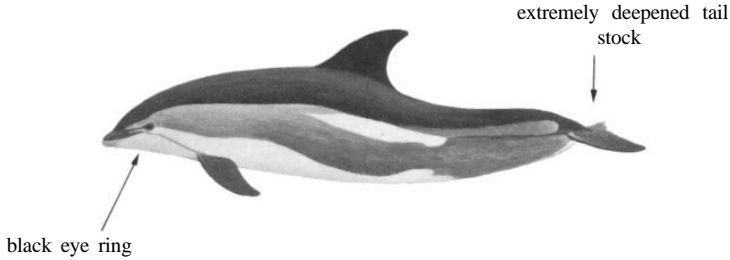


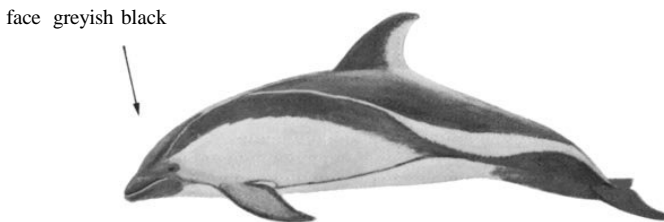
Fig. 101 *Lagenorhynchus albirostris*

- 57a.** Back dark grey, belly white, and sides light grey with white (below the dorsal fin) and yellowish brown (on the tail stock) patches; black eye ring; extremely deepened tail stock; 30 to 40 teeth in each row; distribution limited to cold waters of the North Atlantic (Fig. 102). . . . . **Atlantic white-sided dolphin (*Lagenorhynchus acutus*)** p. 146
- 57b.** Large light grey thoracic patch and grey stripes on tail stock with extensions running forward to thoracic area. . . . . → 58



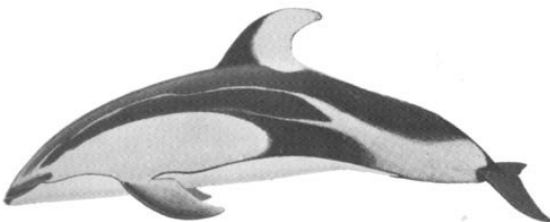
**Fig. 102 *Lagenorhynchus acutus***

- 58a.** Black to dark grey above, white below, with light grey patches on sides; face, beak, melon, and most of the chin greyish black; body relatively robust; 27 to 33 teeth in each row; maximum size to 2.5 m; known distribution limited to southern South America and around Palmerston Atoll (although the latter is possibly extralimital) (Fig. 103) . . . . . **Peale's dolphin (*Lagenorhynchus australis*)** p. 150
- 58b.** Much of face and lower jaw white to light grey; dorsal fin bicoloured . . . . . → 59



**Fig. 103 *Lagenorhynchus australis***

- 59a.** Appendages relatively large; dorsal fin bicoloured and falcate (sometimes extremely hooked); back dark grey with light "suspender stripes" from forehead to tail stock, white belly, light grey thoracic patches (black lines separate belly from sides); 23 to 36 pairs of teeth in each jaw; maximum body length 2.5 m; distribution limited to North Pacific (Fig. 104). . . . . **Pacific white-sided dolphin (*Lagenorhynchus obliquidens*)** p. 140
- 59b.** Belly white, back dark, flank patch light grey (no black line separates thoracic patch and belly); dorsal fin and flippers bicoloured; 27 to 36 teeth in each tooth row; maximum length 2.1 m; distribution limited to Southern Hemisphere (known mostly from South America, southern Africa, and New Zealand) (Fig. 105) . **Dusky dolphin (*Lagenorhynchus obscurus*)** p. 142



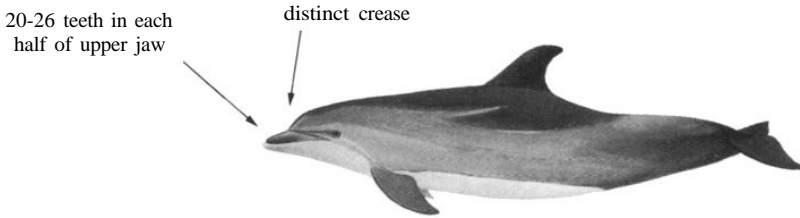
**Fig. 104 *Lagenorhynchus obliquidens***



**Fig. 105 *Lagenorhynchus obscurus***

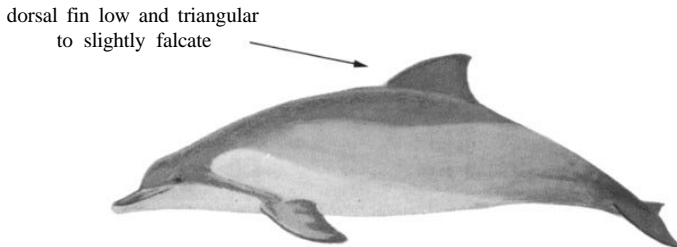
- 60a.** Less than 39 teeth per tooth row; colour pattern mostly uniform grey (may be lighter below) . . . . . → **61**
- 60b.** Greater than 39 teeth per row; colour pattern generally with bold stripes, patches, or spots. . . → **64**

- 61a.** Moderately robust; 20 to 26 teeth in each half of upper jaw, 18 to 24 in lower jaw (teeth may be extensively worn or missing); body to 3.8 m; moderately long robust snout set off by distinct crease; colour dark to light grey dorsally, fading to white or even pink on belly (Fig. 106) . . . . . **Bottlenose dolphin (*Tursiops truncatus*)** p. 154
- 61b.** In each tooth row 26 or more teeth: indistinct crease between melon and beak . . . . . → **62**



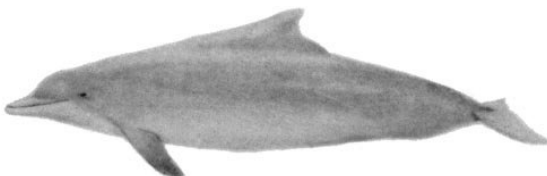
**Fig. 106. *Tursiops truncatus***

- 62a.** Back dark grey and belly light; beak long without distinct crease; low triangular to slightly falcate dorsal fin; 26 to 35 teeth in each tooth row; maximum size to 2.1 m; distribution limited to coasts, rivers, and lakes of the east coast of South America from Panama to southern Brazil, including the Amazon and Orinoco drainage basins (Fig. 107) . . . . . **Tucuxi (*Sotalia fluviatilis*)** p. 132
- 62b.** Body grey with bluish, cream, or pink tinge, and light belly: base of dorsal fin of adults often expanded to form longitudinal ridge, especially west of Bay of Bengal; beak long, crease indistinct; 27 to 38 teeth in each tooth row; maximum size to 2.8 m (Figs 108 and 109). . . . . **(Hump-backed dolphin)** → **63**



**Fig. 107 *Sotalia fluviatilis***

- 63a.** Distribution limited to Indo-Pacific, from the southern tip of Africa to Australia and eastern China (Fig. 108) . . . . . **Indo-Pacific hump-backed dolphin (*Sousa chinensis*)** p. 134
- 63b.** Distribution limited to Atlantic off West Africa (Fig. 109) . . . . . **Atlantic hump-backed dolphin (*Sousa teuszii*)** p. 136



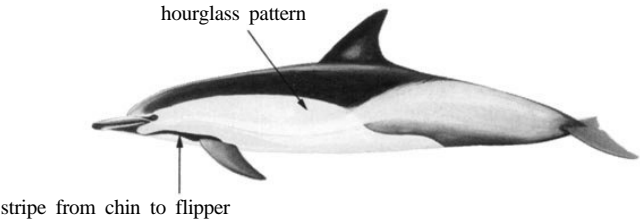
**Fig. 108 *Sousa chinensis***



**Fig. 109 *Sousa teuszii***

**64a.** Dorsal fin erect to slightly falcate; back dark and belly white; tan to buff thoracic patch and light grey streaked tail stock form an hourglass pattern that crosses below dorsal fin: cape forms a distinctive V below dorsal fin; stripe from chin to flipper (contacts gape in some individuals); maximum size 2.5 m; 40 to 61 teeth in each row; palate with 2 deep longitudinal grooves (Fig. 110) ..... **Common dolphin (*Delphinus delphis*)** p. 166

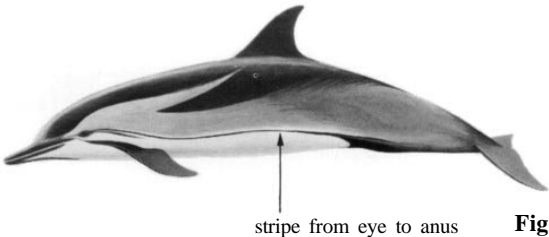
**64b.** No hourglass pattern on side; palatal grooves, if present, shallow . . . . . (*Stenella* sp.) → 65



**Fig. 110 *Delphinus delphis***

**65a.** Colour pattern black to dark grey on back, white on belly, prominent black stripes from eye to anus and eye to flipper; light grey spinal blaze extending to below dorsal fin (not always present); shallow palatal grooves often present; 39 to 55 teeth in each row; maximum size 2.6 m (Fig. 111) ..... **Striped dolphin (*Stenella coeruleoalba*)** p. 164

**65b.** Generally, no stripe from eye to anus; distribution limited to tropical and warm temperate waters . . . . . → 66



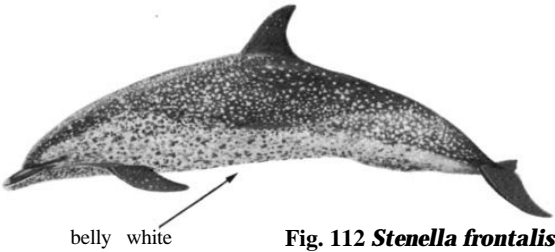
**Fig. 111 *Stenella coeruleoalba***

**66a.** Light to heavy spotting present on dorsum of adults (on some individuals, spots may appear absent); no palatal grooves. . . . . (**Spotted dolphin**) → 67

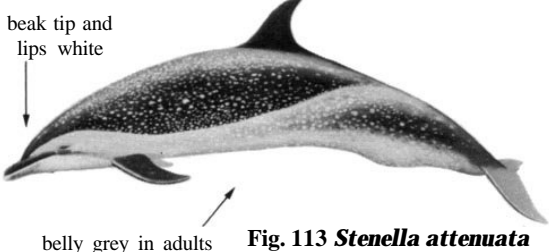
**66b.** No spotting on dorsum of adults; cape dips to lowest point at level of dorsal fin; stripe from eye to flipper: shallow palatal grooves often present . . . . . → 68

**67a.** Body moderately robust, dark grey above, with white belly: light spinal blaze; slight to heavy spotting on adults (occasionally spotting nearly absent); maximum size 2.3 m; 30 to 42 teeth per row; distribution limited to warm waters of the Atlantic Ocean (Fig. 112) ..... **Atlantic spotted dolphin (*Stenella frontalis*)** p. 158

**67b.** Dorsal fin narrow and falcate; dark cape that sweeps to lowest point on side in front of dorsal fin; dark stripe from gape to flipper; beak tip and lips white; adults with light to extensive spotting and grey bellies (spotting sometimes absent); 34 to 48 teeth in each half of each jaw; maximum size 2.6 m (Fig. 113). . . . . **Pantropical spotted dolphin (*Stenella attenuata*)** p. 156



**Fig. 112 *Stenella frontalis***



**Fig. 113 *Stenella attenuata***

1) Body and beak relatively robust; heavy spotting that nearly obliterates cape; known distribution limited to within 185 km of the coast in the eastern tropical Pacific . . . . .

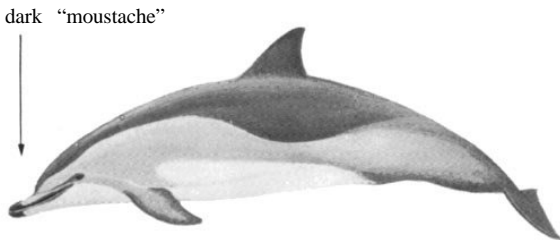
. . . . . **Coastal spotted dolphin (Coastal form of *Stenella attenuata*)**

2) Body and beak slender; spotting slight to moderate; maximum body length 2.3 m; distributed more than 30 km from shore in eastern tropical Pacific and found in oceanic waters worldwide . . . . .

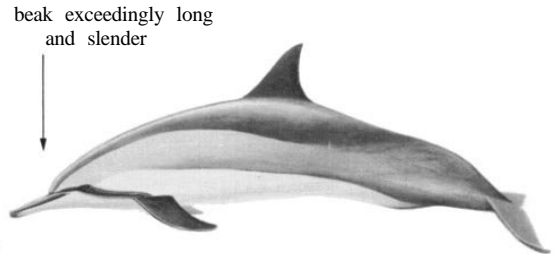
. . . . . **Offshore spotted dolphin (Offshore form of *Stenella attenuata*)**

**68a.** Body colour three-part (dark grey cape, light grey flanks, white belly); cape dips in 2 places (above eye, and below dorsal fin); snout light grey with dark tip, dark lips, and dark line from tip to apex of melon; often, dark “moustache” on top of beak; more robust than spinner dolphins; 38 to 49 teeth in each tooth row; maximum size 2.0 m; distribution limited to tropical Atlantic Ocean (Fig. 114) . . . . . **Clymene dolphin (*Stenella clymene*) p. 162**

**68b.** Dorsal fin slightly falcate to canted forward; beak exceedingly long and slender; 45 to 65 very fine sharply pointed teeth per tooth row; maximum size 2.4 m (Fig. 115) . . . . . **Spinner dolphin (*Stenella longirostris*) p. 160**



**Fig. 114 *Stenella clymene***



**Fig. 115 *Stenella longirostris***

1) Colour pattern three-part (white belly, light grey sides, dark grey cape); dorsal fin falcate to erect; body more robust than in other forms; post-anal hump of adult males nearly absent; distribution worldwide, except eastern tropical Pacific. . . . .

. . . . . **Gray's spinner dolphin (*S. 1. longirostris*)**

2) Pigmentation monotone grey, with light patches around genital area and axillae; dorsal fin triangular to canted forward (extremely canted in adult males); adult males with deepened tail stock and enlarged post-anal hump; maximum size 2 m; known distribution limited to the eastern tropical Pacific east of 145°W . . . **Eastern spinner dolphin (*S. 1. orientalis*)**

3) Pigmentation monotone grey; apparently, no light patches around genital area and axillae; dorsal fin triangular to canted forward (extremely canted in adult males); adult males with deepened tail stock and enlarged post-anal hump; known distribution limited to 80 km offshore from southern Mexico to Panama in the eastern tropical Pacific . . . . .

. . . . . **Central American spinner dolphin (*S. 1. centroamericana*)**

4) Body slightly more robust than above 2 forms; colour pattern largely bipartite, with dark dorsal cape, and white belly and lower sides; dorsal fin slightly falcate to slightly canted (tending towards canted in adult males); post-anal hump of adult males small to moderate; distribution limited to offshore eastern tropical Pacific . . . . .

. . . . . **Whitebelly spinner dolphin (hybrid between *S. 1. longirostris* and *S. 1. orientalis*)**

2.2 Key to Identification of Skulls of Cetacean Families

- 1a. Teeth absent; skull bilaterally symmetrical; lower jaw lacking bony symphysis; size always large (adults >1 m) (Fig. 116). . . . . (Mysticeti) → 2
- 1b. Teeth present (although they may not emerge from jaw bones in *Monodon* or some beaked whales); skull generally asymmetrical; lower jaw possessing a bony symphysis; skull generally relatively small (>1.5 m, except in *Physeter*) (Fig. 117) . . . . . (Odontoceti) → 5

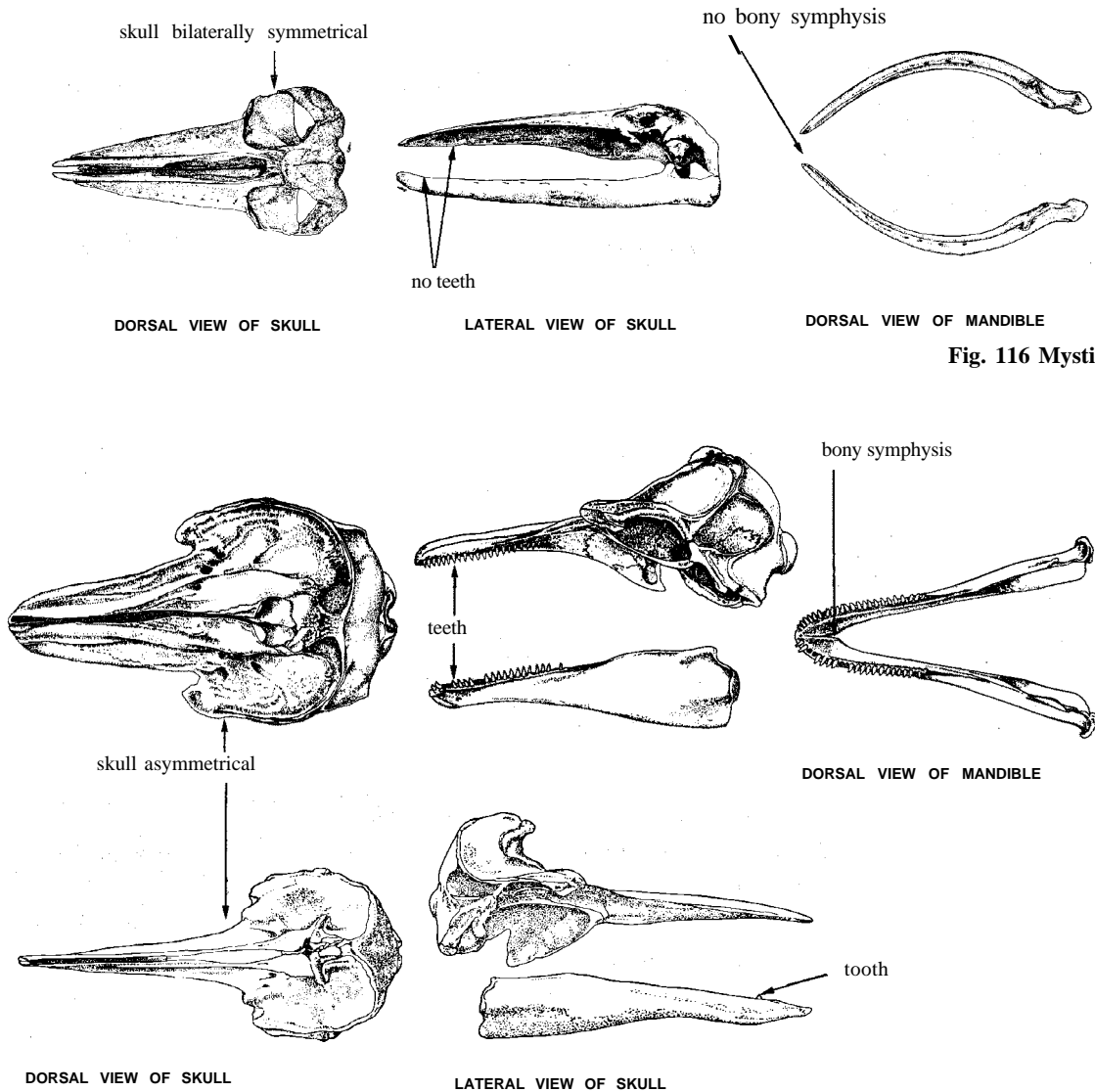
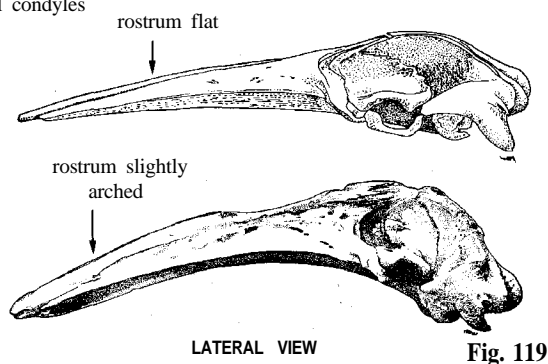
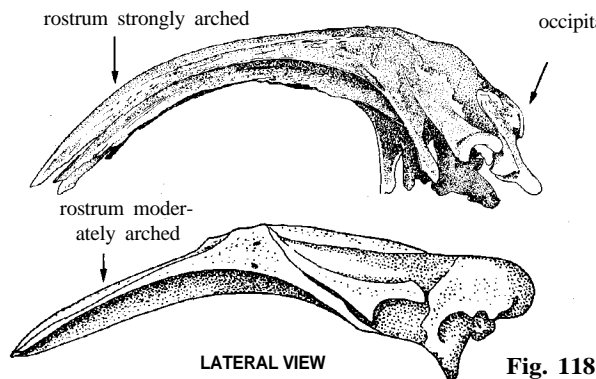


Fig. 116 Mysticeti

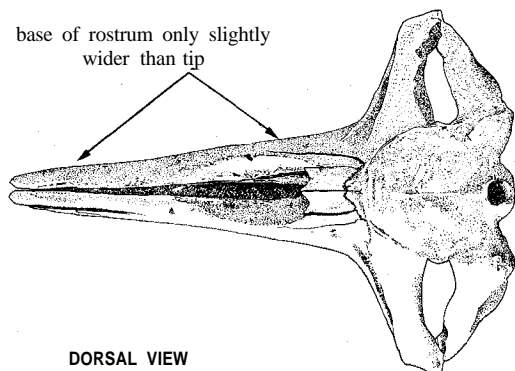
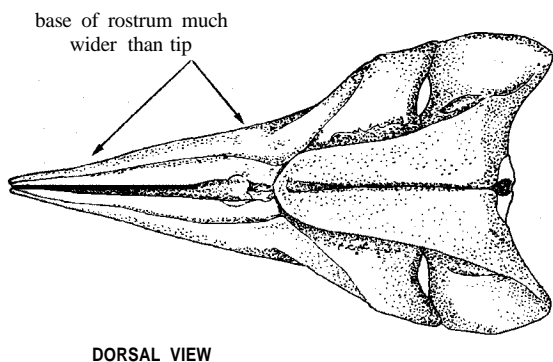
Fig. 117 Odontoceti



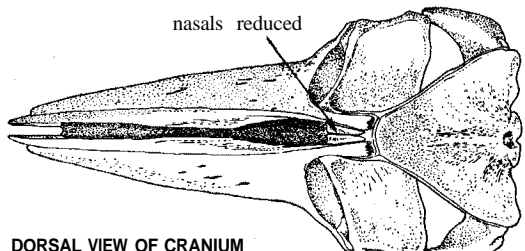
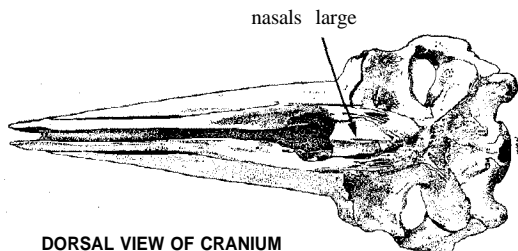
- 2a. Rostrum moderately to strongly arched in side view: from dorsal or ventral view, occipital condyles do not generally extend to or past posterior portion of cranium (Fig. 118) ...  
 ..... (Balaenidae or Neobalaenidae) → 3
- 2b. Rostrum flat or only slightly arched in side view; from dorsal or ventral view, occipital condyles extending to or beyond posterior portion of cranium (Fig. 119) .....  
 ..... (Balaenopteridae or Eschrichtiidae) → 4



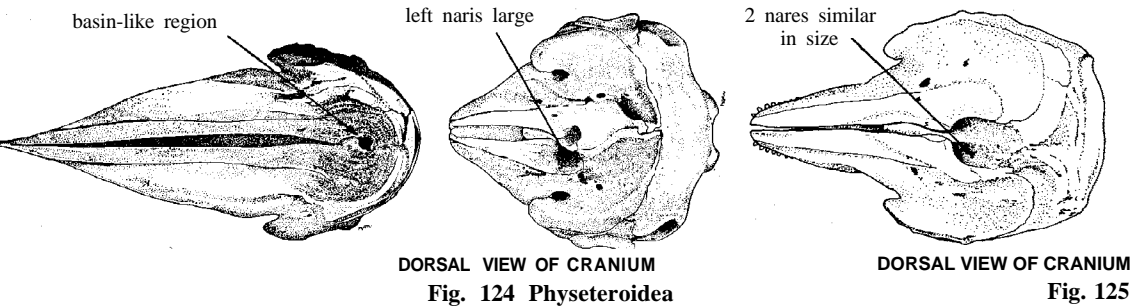
- 3a. Base of rostrum much wider than tip; from side, rostrum moderately arched (Fig. 120) .  
 ..... Neobalaenidae: **Caperea** (Pygmy right whale) p. 48
- 3b. Base of rostrum only slightly wider than tip; from side, rostrum strongly arched; mandibles extremely bowed out (Fig. 121) ..... Balaenidae: Right or bowhead whales



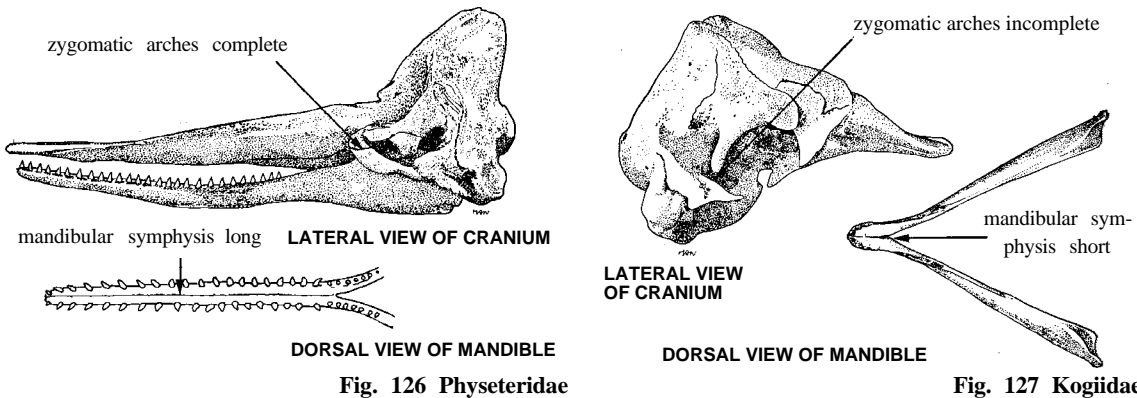
- 4a. Rostrum slightly arched from side; nasals large; frontals exposed on vertex (Fig. 122) .  
 ..... Eschrichtiidae: **Eschrichtius** (Gray whale) p. 62
- 4b. Rostrum relatively flat from side (may be slightly arched in sei whale); nasals reduced; frontals barely, or not at all, visible on vertex (Fig. 123) ..... Balaenopteridae: Rorquals



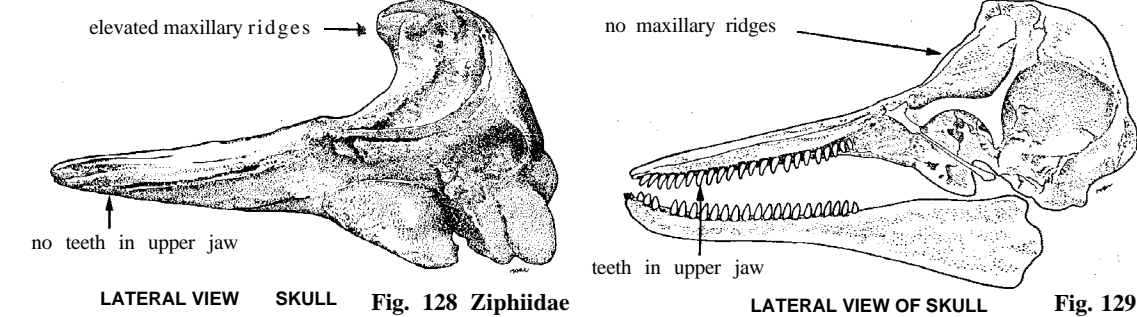
- 5a. Anterior cranial region basin-like; skull extremely asymmetrical; left naris much larger than right: teeth generally confined to lower jaw (except in some dwarf sperm whales) (Fig. 124). . . . . (Physeteroidea) → 6
- 5b. Anterior cranial region not basin-like; skull slightly to strongly asymmetrical: 2 nares similar in size (Fig. 125) . . . . . → 7



- 6a. Rostrum long (greater than half length of skull); zygomatic arches complete; 18 to 25 pairs of teeth; mandibular symphysis long (>30% of mandible length) (Fig. 126) . . . . . **Physeter (Sperm whale) p. 68**
- 6b. Rostrum short (less than half length of skull); zygomatic arches incomplete; 8 to 16 pairs of teeth; mandibular symphysis short (<30% of mandible length) (Fig. 127) . . . . . **Kogiidae: *Kogia* (Pygmy or dwarf sperm whale) p. 70**



- 7a. Large teeth restricted to lower jaw (small, conical upper jaw teeth are present in *Tasmacetus*); elevated maxillary ridges behind nasals; rostrum long and slender, depth nearly as great as, or greater than, width (Fig. 128). . . . . **Ziphiidae: Beaked whales**
- 7b. Teeth of uniform size (except in some *Monodon*); no maxillary ridges (except in *Platanista*, in which they arch inwards and upwards over the nasals); rostrum wider than deep (Fig. 129) . . . → 8



- 8a. Mandibular symphysis long (at least one-third length of mandible): rostrum long and narrow, of nearly uniform width from base to tip (Fig. 130) ..... (**Platanistoidea**) → 9
- 8b. Mandibular symphysis relatively short (generally less than one-third length of mandible); rostrum generally narrows appreciably toward tip (Fig. 131) ..... → 11

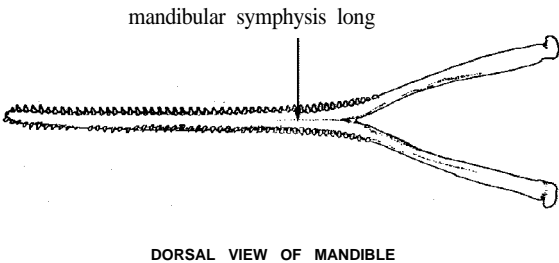


Fig. 130 Platanistoidea

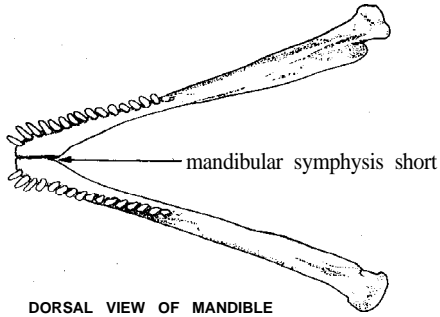


Fig. 131

- 9a. Well-developed maxillary crests present; 26 to 39 teeth in each tooth row, anterior teeth larger than posterior ones (Fig. 132) ..... **Platanistidae: Platanista (River dolphins)** p. 194
- 9b. No enlarged maxillary crests; teeth of approximately uniform size (Fig. 133) ..... → 10

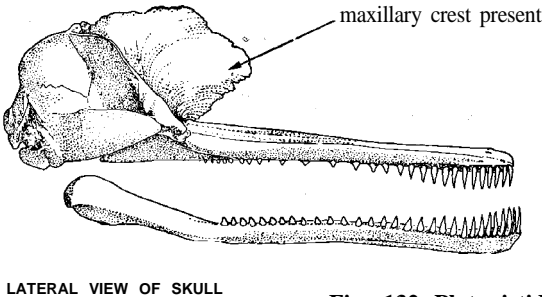


Fig. 132 Platanistidae

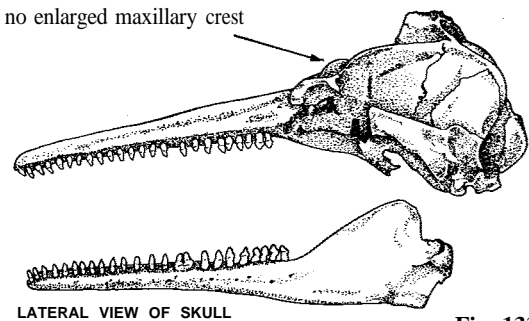


Fig. 133

- 10a. Mandibular symphysis less than one-half length of mandible; 23 to 35 teeth in each row, those at back have flattened crowns (Fig. 134) ..... **Iniidae: Inia (Boto)** p. 198
- 10b. Mandibular symphysis at least one-half length of mandible: teeth undifferentiated (Fig. 135) ..... **Pontoporiidae: Baiji and Franciscana**

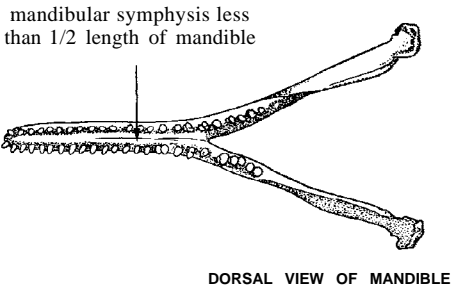


Fig. 134 Iniidae

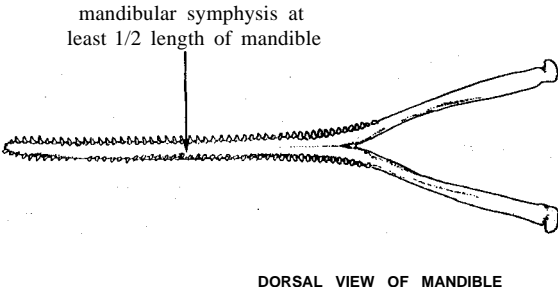


Fig. 135 Pontoporiidae

- 11a. Dorsal profile of skull nearly flat from side; teeth confined to front two-third of jaws, less than 12 in each row (Fig. 136) . . . . . **Monodontidae: White whale and narwhal**
- 11b. Dorsal profile of skull rising sharply at level of nares; teeth generally numerous in both jaws (except for Grampus, which has teeth only in the lower jaw ) (Fig. 137) . . . . . **(Delphinidae or Phocoenidae) → 12**

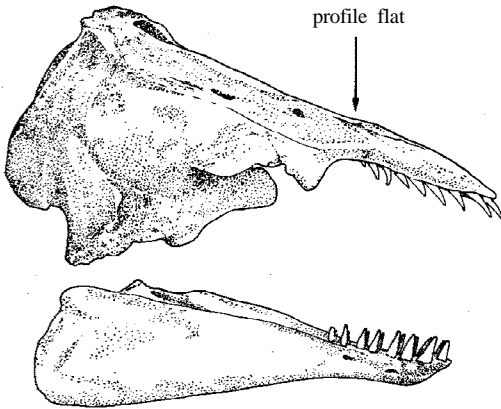


Fig. 136 Monodontidae

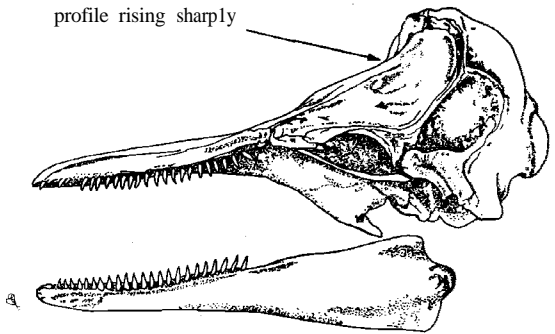
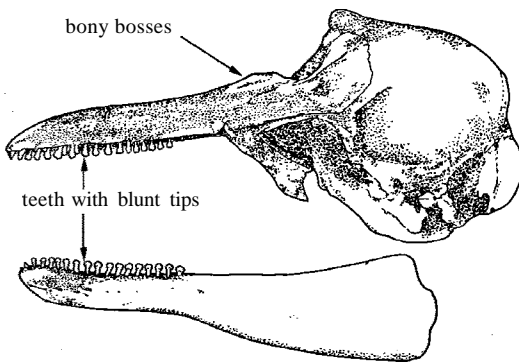


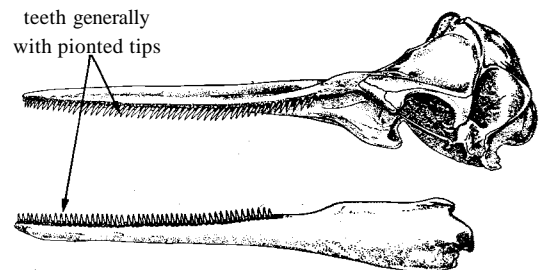
Fig. 137

- 12a. Teeth spade-shaped, with blunt tips; raised bony bosses in front of nares; 10 to 28 teeth in each row (Fig. 138). . . . . **Phocoenidae: Porpoises**
- 12b. Teeth circular or oval in cross-section, generally with pointed tips (except in *Orcaella*, or unless worn or broken); no bosses in front of nares (Fig. 139) . . **Delphinidae: Oceanic dolphins**



LATERAL VIEW

Fig. 138 Phocoenidae



LATERAL VIEW

Fig. 139 Delphinidae

## 2.3 SUBORDER MYSTICETI - Baleen Whales

### MYSTICETI

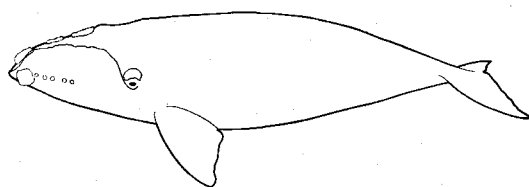
There are 4 families of baleen whales. Mysticetes are universally large (with females growing larger than males); the smallest is the pygmy right whale (c 7 m long), and the largest is the blue whale (the largest animal ever to live, up to 33 m or more in length and 160 t in weight). The baleen whales have a double blowhole, a symmetrical skull, and a sternum consisting of a single bone. In the mouth there is baleen (stiff plates of keratin), instead of teeth. Baleen whales are batch feeders, taking in great quantities of water in a single gulp, and then using the fringes on their baleen plates to filter small schooling fish or invertebrates from the water. Nearly all mysticetes make long-range seasonal migrations.

### 2.3.1 Guide to Families of Baleen Whales

#### BALAENIDAE

**Right and Bowhead Whales** (3 species in 2 genera) p. 42

The right and bowhead whales are large and chunky, with heads that comprise up to one-third of their body length. They lack a dorsal fin or any trace of a dorsal ridge. Overall, they tend to be far less streamlined than other baleen whales. Right and bowhead whales have developed a relatively passive skim-feeding technique, and tend to be slower than other whales. The baleen plates are the longest and have the finest fringes of the 4 mysticete families. Viewed in profile, the mouthline is extremely arched and the skull profile is highly convex; all 7 neck vertebrae are fused together.

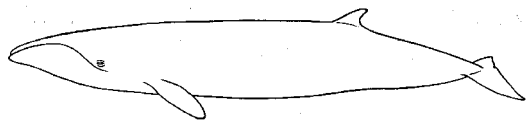


**Fig. 140 Balaenidae**

#### NEOBALAENIDAE

**Pygmy Right Whale** (1 species in 1 genus) p. 48

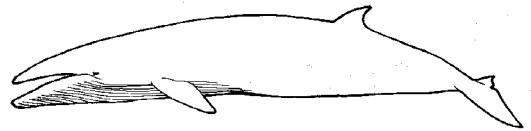
The single species in this family, the pygmy right whale of the Southern Hemisphere, is poorly known. Although it is in some ways intermediate between the Balaenopteridae and Balaenidae, the pygmy right whale is more closely related to the Balaenidae. Much smaller than the right and bowhead whales (< 7 m), it is slender, with a moderately arched mouthline. The head represents only about one-quarter of the total length, and there is a short falcate dorsal fin set behind midback. There is also a pair of shallow throat grooves. The skull is also somewhat intermediate; the rostrum is moderately arched (reminiscent of balaenids), but is much wider at its base (reminiscent of balaenopterids).



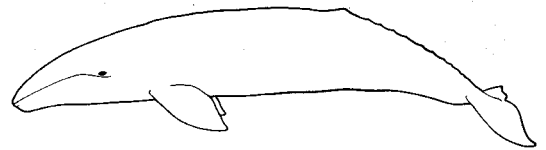
**Fig. 141 Neobalaenidae**

**BALAELOPTERIDAE****Rorquals** (6 species in 2 genera) p. 50

This family contains the largest animals ever to live; all balaenopterids have adult body lengths of over 7 m, and some are much larger. The rorquals are streamlined animals (the humpback whale somewhat less so than the others), with a series of long pleats extending from the snout tip to as far back as the navel on the ventral surface. Balaenopterids are fast and active lunge feeders; their morphology allows them to open their jaws very widely and distend their throats to take in huge mouthfuls of water during feeding. The baleen plates are of moderate length and fringe fineness. Density and fringe diameter vary among species, and along with plate number and width to length ratio, are diagnostic characters. Rorquals have dorsal fins (varying in size and shape) set behind the midpoint of the back. The upper jaw has a relatively flat profile, a feature reflecting the structure of the skull. Within a given feature, differences among balaenopterids are often subtle variations on a theme, rather than class distinctions. Therefore, information on many features may be needed to distinguish among them and reliance on a single character for identification is discouraged.

**Fig. 142 Balaenopteridae****ESCHRICHTIIDAE****Gray Whale** (1 species in 1 genus) p. 62

The gray whale was once present in both the Atlantic and Pacific oceans, but has been exterminated in the North Atlantic in the last few hundred years. This monotypic family is in some ways intermediate between the Balaenidae and the Balaenopteridae. The gray whale is stocky and has an arched jaw, but neither of these characters is as pronounced as in the right whales. Gray whales are slow-moving coastal animals that suck prey from the bottom sediments. Gray whales have the shortest and coarsest baleen of all species, a feature that probably reflects both the size of their prey and their tendency to take in gravel, sand, and other debris during feeding. There are 2 to 5 short throat creases, a dorsal hump followed by a series of knobs or knuckles along the dorsal surface of the tail stock, and only 4 digits in the flipper.

**Fig. 143 Eschrichtiidae**

### 2.3.2 FAO Species Identification Sheets

*Eubalaena glacialis* (Müller, 1776)

BAL Eub 1

EUG

**FAO Names:** En - Northern right whale; Fr - Baleine de Biscaye; Sp - Ballena franca,

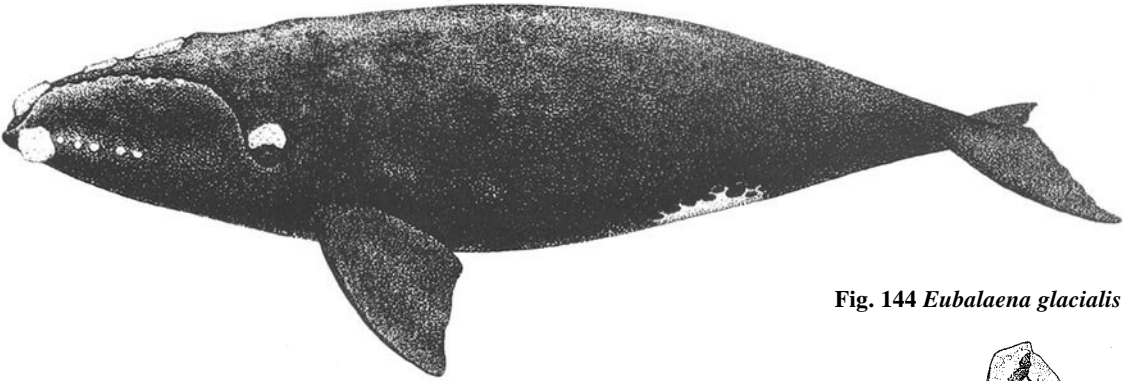


Fig. 144 *Eubalaena glacialis*

**Distinctive Characteristics:** The northern right whale is one of the stockiest of all whales. It has a massive head that can be up to nearly one-third of its body length. The jawline is arched and the upper jaw is very narrow in dorsal view. The flippers are broad and tend to be more fan-shaped than the pointed flippers of most other cetaceans. There is no dorsal fin or dorsal ridge on the broad back. The flukes are very wide and smoothly tapered, with a smooth trailing edge and a deep notch.

Most right whales are predominantly black, but there may be large white splotches of varying extent on the belly and chin. The head is covered with callosities, areas of roughened skin to which whale lice and sometimes barnacles attach. The largest of these callosities, on the top of the rostrum, is called the bonnet.

The widely separated blowholes produce a V-shaped blow up to 5 m high. Inside the mouth are 200 to 270 long thin baleen plates, which may reach nearly 3 m in length. They are brownish grey to black in colour. The fringes of these plates are very fine, reflecting the small prey taken by this species.

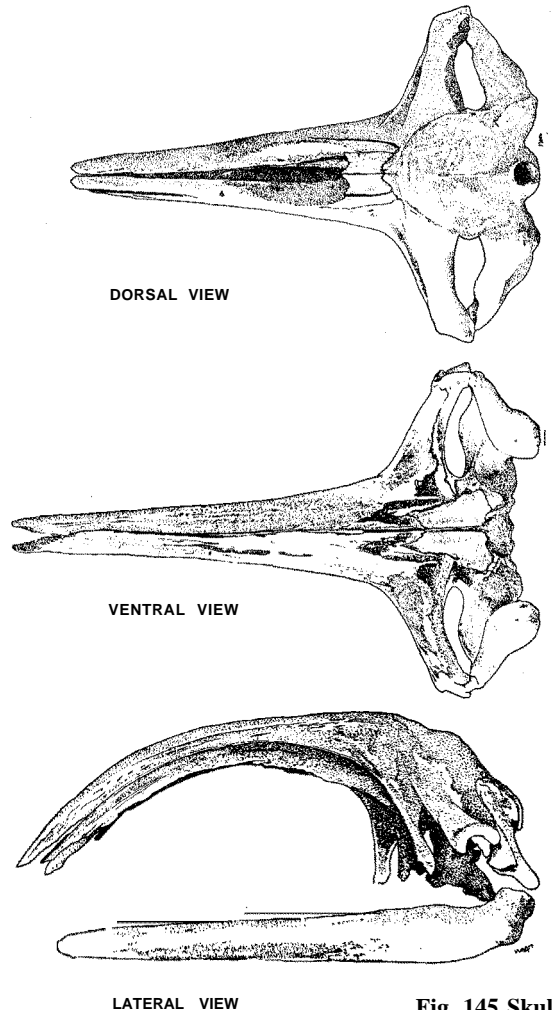


Fig. 145 Skull



Fig. 146 Surface - blow - dive profile

**Can be confused with:** In the northern extremes of their range, especially in the Bering and Okhotsk seas, northern right whales may be confused with bowhead whales (p. 46). Bowhead whales lack callosities and right whales have white patches only on the belly.

**Size:** Adults range in length to 17 m, but may occasionally reach 18 m. Females are larger than males. Newborns are 4.5 to 6 m long. Adults may reach weights of 80 to 100 t.

**Geographical Distribution:** Right whales primarily inhabit temperate and subpolar waters. Northern right whales are now extremely rare in the North Pacific and little is known of their current distribution there. The 2 North Atlantic populations are presumably isolated from each other, and the eastern stock is thought to be near extinction. Calving and feeding areas throughout the world are most often in shallow nearshore regions.

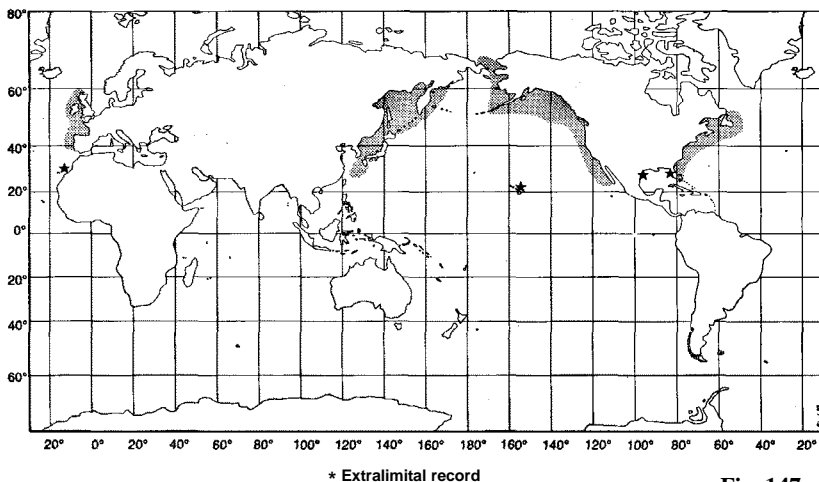


Fig. 147

**Biology and Behaviour:** Right whales are mostly seen in groups of less than 12 (most often singles or pairs). Larger groups may form on feeding or breeding grounds. They can be aerially active and generally raise their flukes before a deep dive. The mating system appears to involve sperm competition (males competing to inseminate females, not so much by physical aggression, as by delivering large loads of sperm, thereby displacing that of other males). Young are born in winter and spring in tropical or subtropical breeding areas. Right whales feed on copepods and other small invertebrates, generally by slowly skimming through patches of concentrated prey at or near the surface.

**Exploitation:** The right whales were the first targets of commercial whaling, starting in the eleventh century. They were sought after because of their thick blubber layer (and thus high yield of oil), long flexible baleen (used for many of the same purposes as plastic is today), slow swimming speeds, and tendency to float when killed. North Pacific right whales were depleted to near extinction by commercial whaling, the most recent episodes of which occurred as "scientific whaling" about 20 years ago. Sightings today are rare, apparently the species is not recovering, even under full protection.

**IUCN Status:** Endangered.



*Eubalaena australis* Desmoulins, 1822

BAL Eub 2

EUA

**FAO Names:** En - Southern right whale; Fr - Baleine australe; Sp - Ballena franca austral.

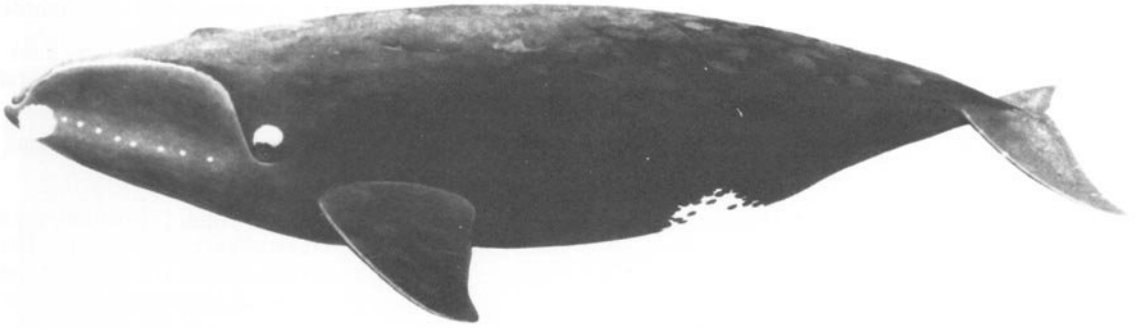
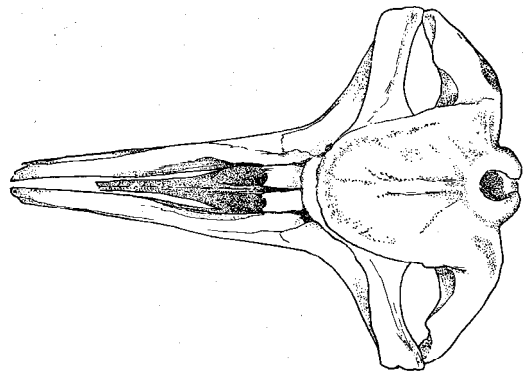


Fig. 148 *Eubalaena australis*

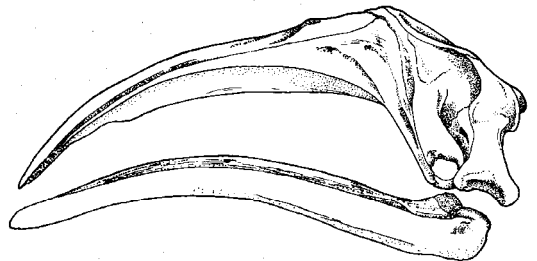
**Distinctive Characteristics:** These stocky whales have extremely large heads, which can be over one-fourth of the body length. The mouthline is bowed and the rostrum is arched and very narrow when viewed from above. As is true for right and bowhead whales in general, there is no trace of a dorsal fin or ridge in the southern right whale. The flippers are fan-shaped, and the flukes are broad with smooth contours. All right whales have callosities on their heads, the largest of which is called the bonnet. These callosity patterns are individually distinctive and have been used by researchers in many areas to identify individuals.

Southern right whales are largely black, but some have white patches of variable shape and size on the belly and sometimes on the back. Colour variants have been noted; these include blue-black, light brown, and nearly white individuals. In addition to those on the callosities, whale lice are common in creases and folds on the bodies of southern right whales.

The 200 to 270 baleen plates per side are narrow and long, up to 3 m in length. The plates tend to be dark grey to black (some can be nearly white) and have fine grey to black fringes. The blow of the southern right whale is relatively short and V-shaped, making this species identifiable at a distance, if seen from ahead or behind.



DORSAL VIEW



LATERAL VIEW

Fig. 149

**Can be confused with:** The southern right whale is the only whale in its range with a smooth, finless back and callosities; this should make misidentifications unlikely. From a distance the bushy, somewhat V-shaped blows of humpback whales (p. 60) can be mistaken for those of right whales. At close range, the 2 species are unmistakable.

**Size:** Southern right whale adults reach up to 17 m in length; females grow larger than males. These animals can reach weights of at least 100 t. Newborn animals are 4.5 to 6 m.

**Geographical Distribution:** Southern right whales are distributed throughout the Southern Hemisphere, from approximately 20°S to 55°S, although they have been observed as far south as 63°S. In winter and spring, the distribution is concentrated near coastlines. Major breeding areas are nearshore off southern Australia, New Zealand, southern South America, and South Africa. A few right whales have been sighted in Antarctic waters in summer.

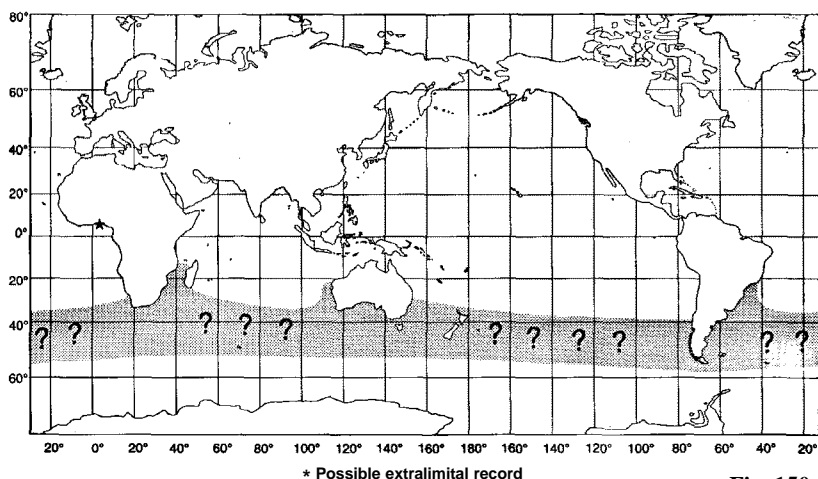


Fig. 150

**Biology and Behaviour:** Southern right whales have been well-studied on their winter breeding grounds, especially at Peninsula Valdes, Argentina, and in South Africa. Researchers have used callosity patterns to identify individuals on these grounds, and have learned much about the right whale's behaviour, communication, and reproduction. Right whales often seem slow and lumbering, but can be surprisingly quick and active. They often breach, and slap their flippers and flukes on the surface. Southern right whales often raise their flukes on a dive.

Most of the breeding in Argentina takes place in August and September, but mating has been observed in most months of the year. Male right whales have huge testes and long penises, 2 characteristics predicted in species in which males compete for females primarily through sperm competition, rather than by direct aggression.

Surface and subsurface skim feeding is the rule in this species. Southern right whales prey on copepods and krill, apparently sometimes feeding near the bottom.

**Exploitation:** Southern right whale populations, like their northern counterparts, have been heavily depleted by commercial whaling. Although not as endangered as the northern species, southern right whale populations are still relatively small. Although fully protected by the IWC, there is probably still some hunting for right whales. Despite the threats from whaling, entanglement in fishing gear, vessel collisions, and habitat destruction, some southern right whale populations have shown recent signs of recovery.

**IUCN Status:** Vulnerable.

*Balaena mysticetus* Linnaeus, 1758

BAL Bala 1

BMY

**FAO Names:** En - Bowhead whale; Fr - Baleine du Groenland; Sp - Ballena de cabeza arqueada.

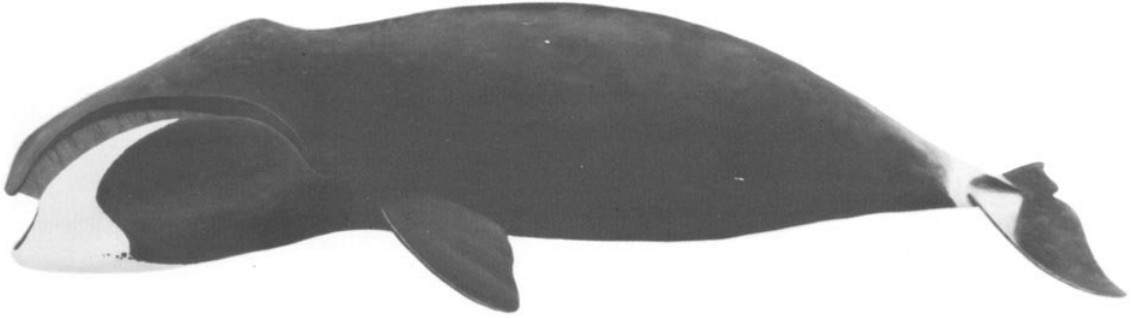
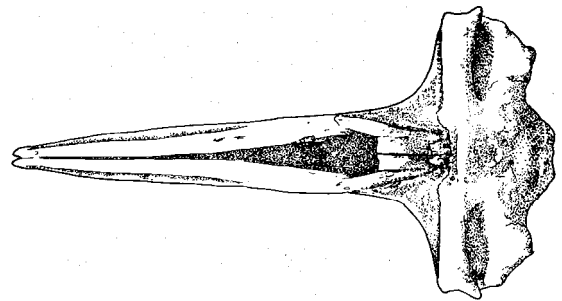


Fig. 151 *Balaena mysticetus*

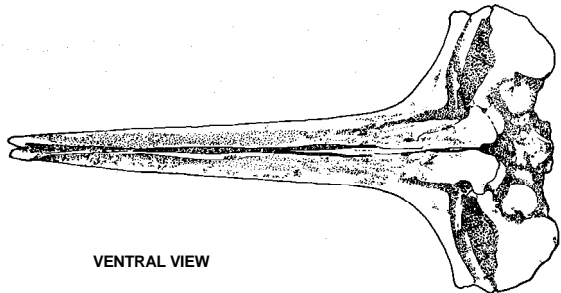
**Distinctive Characteristics:** Bowhead whales are extremely rotund overall, but often have a distinct “neck” region. The head is large (up to one-third of the body length); the upper jaw is arched and narrow when viewed from above. The mouthline is strongly bowed, and the eye is placed just above the corner of the mouth. There is no dorsal fin or ridge, and the back is very broad. The flippers have blunt tips and the flukes are wide with smooth contours. There is a large muscular bulge (the stack) in the blowhole area.

Predominantly black in colour, bowheads have a white patch at the front of the lower jaw; this patch often has several dark grey to black spots, each indicating the position of a chin hair. There is also often a light grey to white band around the tail stock, just in front of the flukes, and sometimes other white or light grey areas on the body. The white on the tail expands with age, and very large, old bowheads may have an almost completely white tail. Some lighter coloured bowheads are occasionally seen.

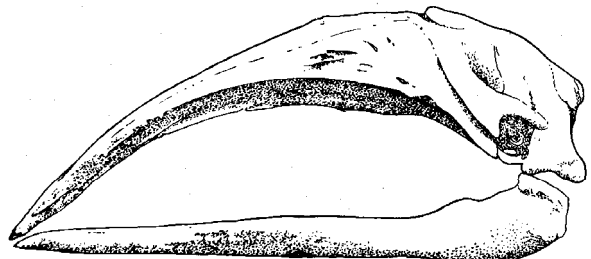
Bowheads have the longest baleen plates of any whale. The 250 to 350 plates in each side of the jaw can reach lengths of 5.2 m; they have long, fine fringes. The plates are dark grey to brownish black, generally with slightly lighter fringes. As is true for the closely related right whale, the blow is V-shaped and bushy.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 152 Skull



Fig. 153 Surface - blow - dive profile

**Can be confused with:** Gray whales (p. 62) use some of the same summer range as bowheads, but the gray whale's dorsal hump and knuckles, and differences in head and body shape, coloration, and behaviour between the 2 species should make them distinguishable. Right whales (p. 42) might also overlap with bowheads, but usually the 2 species are separated by their ecological preferences. The right whale's callosities and absence of light chin and peduncle patches will allow them to be distinguished from bowheads.

**Size:** Male bowhead whales range to 18 m in length, females to 20 m. Weights of large individuals have been estimated at about 75 to 100 t. Calves are about 4 to 4.5 m long at birth.

**Geographical Distribution:** Bowheads are found only in arctic and subarctic regions. There are several stocks in the North Atlantic Ocean, and the Bering, Beaufort, Chukchi, and Okhotsk seas. These animals live much of their lives among the pack ice, migrating to the high arctic in summer, but retreating southward in winter with the advancing ice edge.

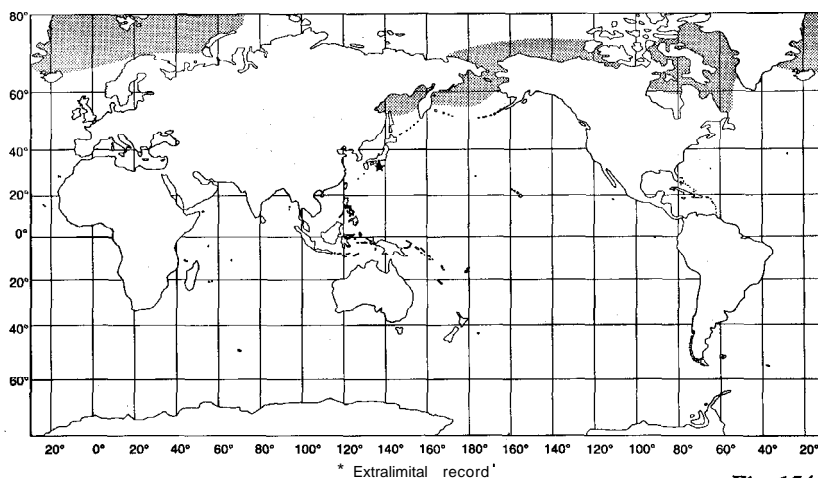


Fig. 154

**Biology and Behaviour:** Bowhead whales are usually seen in groups of 3 or fewer, but larger aggregations form during the autumn migration and on the feeding grounds. Although often slow-moving, bowheads breach and engage in other aerial behaviour. They frequently lift their flukes before a steep dive. Low frequency calls are common, at least during migration.

Calves are born mainly in spring as whales migrate toward feeding grounds. The breeding system is thought to be similar to that of the right whale, with males using a form of sperm competition. Small to medium-sized invertebrates, especially krill and copepods, form the bulk of the bowhead's diet. Bowheads skim feed at the surface and feed in the water column. It has recently been suggested that they also feed near the bottom, but probably do not directly ingest sediments as gray whales routinely do. During surface skim feeding, coordinated group patterns have been observed, including whales feeding in echelon (V-shaped) formation.

**Exploitation:** Bowhead whales were heavily hunted for several centuries. Today they are partially protected by the IWC. The current world population is still threatened by small-scale hunting by Alaskan, Canadian, and Russian natives. In addition, there are various forms of habitat degradation, including disturbance from oil and gas exploration and development activities.

**IUCN Status:** Vulnerable.

*Caperea marginata* (Gray, 1846)

NEOBA Cap 1

CPM

**FAO Names:** En - Pygmy right whale; Fr - Baleine pygmée; Sp - Ballena franca pigmea.

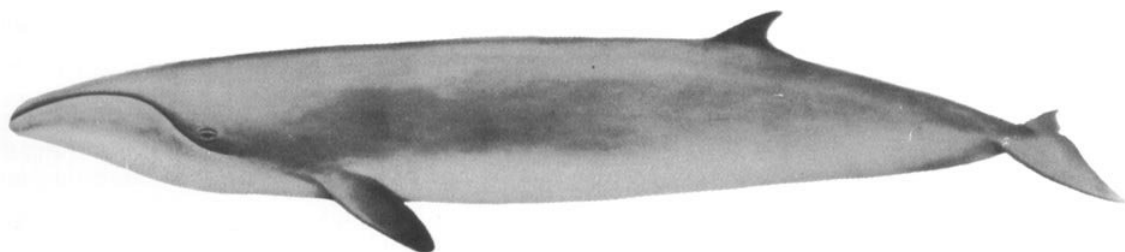
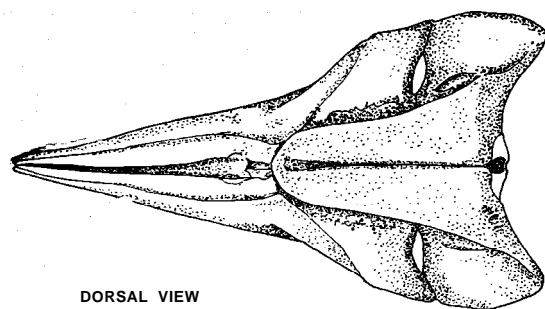


Fig. 155 *Caperea marginata*

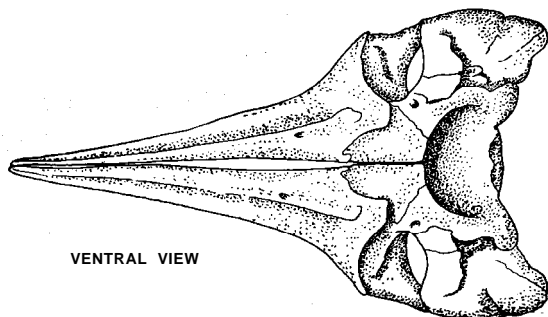
**Distinctive Characteristics:** The pygmy right whale is the only right whale with a dorsal fin. The falcate fin is set about two-thirds of the way back from the snout tip. This species is atypical of right whales in other ways as well: it is rather slender, resembling more the streamlined rorquals than the chunky right and bowhead whales, and the head is not large (less than one-quarter of the body length). The pygmy right whale is like other right whales in that it has an arched jawline; also the upper jaw curves downward toward the tip, although not as much as in balaenids. The flippers are small and slender with rounded tips. There are 2 shallow throat creases, reminiscent of those in gray whales.

The colour of the body is dark grey above, ranging to white below. The flippers and flukes are dark grey.

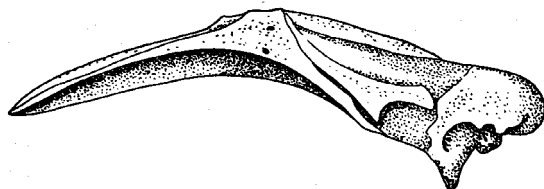
The baleen plates in this species number about 213 to 230 in each side of the upper jaw. They are up to 68 cm long and are said to be very flexible and tough. The colour of the plates is yellowish white.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 156 Skull

**Can be confused with:** This species can easily be confused with the minke whale (p. 58), but the differences in head shape and the white flipper bands present in most populations of minke whales will allow differentiation when specimens are seen clearly. From a distance, the back and dorsal fin could be confused with those of a beaked whale; however, beaked whales have very different head shapes.

**Size:** The maximum recorded length for a male is 6.1 m and that for a female is 6.5 m. They reach weights of at least 3 200 kg. At birth, pygmy right whales are about 2 m long.

**Geographical Distribution:** The pygmy right whale is known only from a few records in the Southern Hemisphere, between the Antarctic Convergence (about 60°S) and about 30°S, in both coastal and oceanic waters.

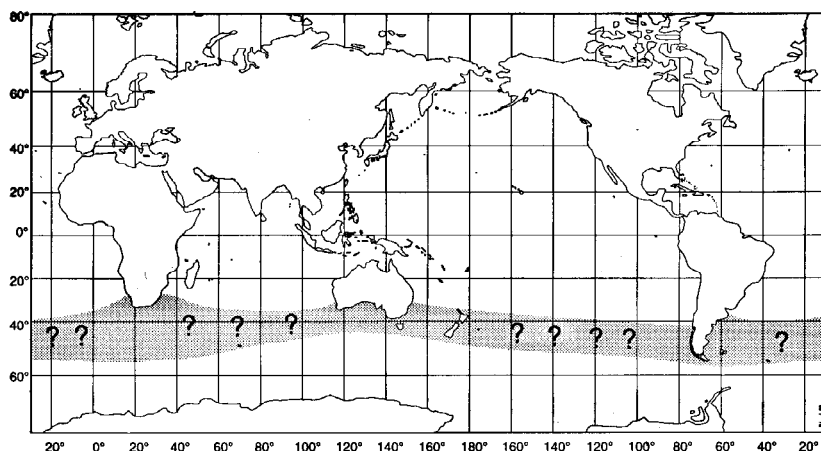


Fig. 157

**Biology and Behaviour:** This is the least known of all the baleen whales. Groups of up to 8 individuals have been seen, but singles or pairs are most common. They are sometimes seen with other species of whales and dolphins.

The inconspicuous small blow and quick shallow surfacings of the pygmy right whale makes it difficult to spot and observe at sea. Sometimes, these animals bring their snout tips out of the water upon surfacing.

Very little is known about reproduction in this species, but the breeding season is thought to be protracted.

Pygmy right whales are known to feed on copepods.

**Exploitation:** The smallest species of baleen whale, the pygmy right whale is also the only one that has not been the target of large-scale commercial whaling. Some animals are incidentally captured in nets off South Africa.

**IUCN Status:** Insufficiently known.

*Balaenoptera musculus* (Linnaeus, 1758)

BALAEN Bal 3

BLW

FAO Names: En - Blue whale; Fr - Rorqual bleu; Sp - Ballena azul.



Fig. 158 *Balaenoptera musculus*

**Distinctive Characteristics:** The blue whale is the largest animal ever known; however, its size substantially overlaps with that of adult fin and sei whales. Like all rorquals, the blue whale is slender and streamlined. The head is broad and U-shaped (like a gothic arch) when viewed from above and relatively flat when viewed from the side. Along the centre of the rostrum, there is a single prominent ridge, which ends in an impressive “splash guard” around the blowholes. The flippers are long and pointed, and the dorsal fin is relatively small, variably shaped, and placed about three-quarters of the way back from the snout tip. The broad flukes have a relatively straight trailing edge and a prominent notch. In the Southern Hemisphere and northern Indian Ocean, a subspecies called the pygmy blue whale (*B. m. breviceauda*), which is shorter and has a relatively larger head, has been described. It is generally not possible to distinguish pygmy blue whales from other blue whales at sea.

Blue whales are bluish grey dorsally and somewhat lighter underneath. The head is uniformly blue, but the back and sides are mottled. When viewed through the water surface they may appear dappled or uniformly light blue. There is light to extensive mottling on the sides, back, and belly, generally in the form of dark spots on a lighter surface, but sometimes the reverse. A chevron, with the vertex behind the blowholes, sometimes marks the transition of coloration between the head and the body. Diatom films on the surface may be seen as an orangish brown or yellow tinge, which gave rise to the alternative name “sulphur-bottom” whale.

On the throat, there are 55 to 88 long pleats extending to or near the navel. The mouth contains 270 to 395 pairs of black, broad-based baleen plates, each less than 1 m long. The blow is tall and slender, reaching 9 m or more in height.

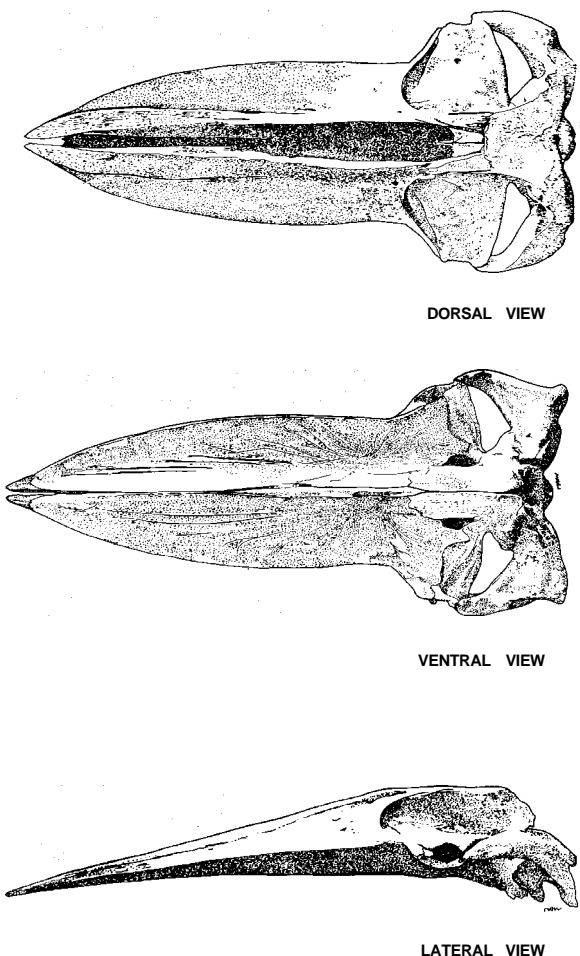
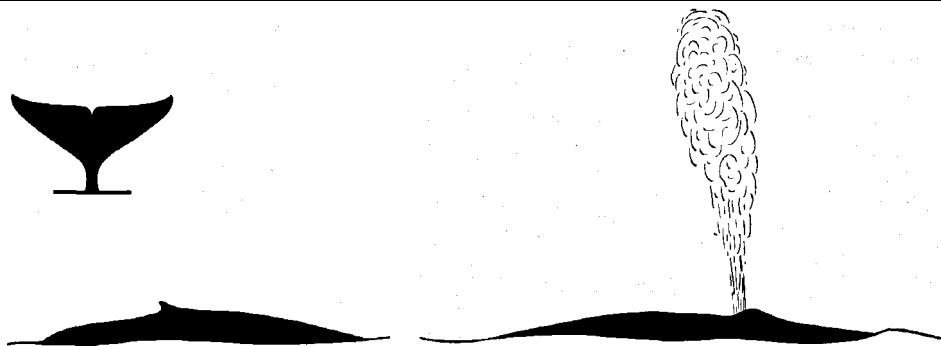


Fig. 159 Skull

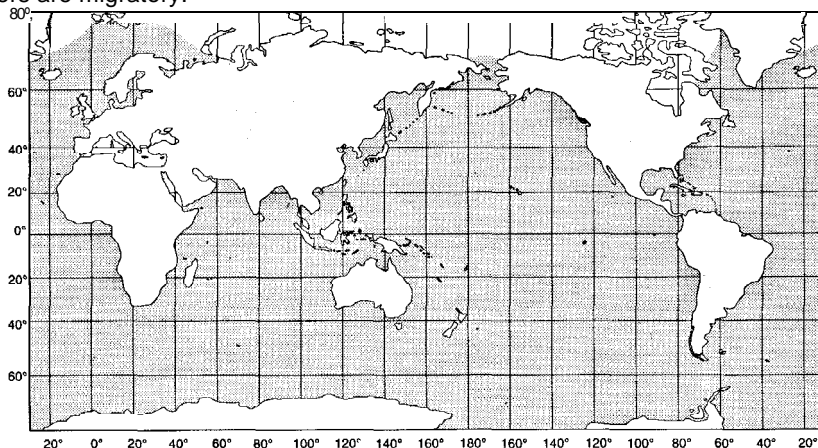


**Fig. 160** Surface - blow - dive profile

**Can be confused with:** Blue whales can be confused with the other large rorquals, fin (p. 52) and sei (p. 54) whales. Although the great size of blue whale adults may aid in identification, the best clues for differentiating blue whales from fin or sei whales are colour pattern, head shape, and dorsal-fin shape and position.

**Size:** Most adults are 23 to 27 m long (with females growing larger than males), but an Antarctic blue whale measuring over 33 m was once taken by whalers. Newborns are about 7 m long. Adults can weigh up to 160 t.

**Geographical Distribution:** Blue whales tend to be open-ocean animals, but come close to shore to feed, and possibly to breed, in some areas. Blue whales can be seen from the equator to the pack ice edges in both hemispheres, with most poleward intrusions in both hemispheres in summer. Some blue whales are resident. others are migratory.



**Fig. 161**

**Biology and Behaviour:** Blue whales are usually seen alone or in pairs. However, scattered aggregations of a dozen or more may develop on prime feeding grounds. Although shorter dives are most common, dives of up to 30 min, generally interspersed with series of shorter surfacings (at 15 to 20 sec intervals), have been recorded. Fluking-up is not uncommon, although not all blue whales are "flukers." Remarkably, some blue whales have been observed breaching.

Calves are born in winter on tropical or subtropical breeding grounds.

Krill form the major part of the blue whale's diet, and on their feeding grounds, blue whales can be observed lunging, often on their sides or upside-down, through great clouds of these invertebrates.

**Exploitation:** From the time faster catcher boats and explosive harpoons made them catchable, blue whales were hunted relentlessly from the late 19th through the mid 20th centuries. As the largest whales, they were the most sought after of the rorquals. Although most populations remain well below pre-exploitation levels, some stocks (such as those that feed off California) have shown encouraging signs of recovery since protection by the International Whaling Commission (IWC) in 1965. At least in the eastern North Atlantic and the eastern North Pacific, numbers appear to be on the rise.

**IUCN Status:** Endangered.



***Balaenoptera physalus*** (Linnaeus, 1758)

BALAEN Bal 4

FIW

FAO Names: En - Fin whale; Fr - Rorqual commun; Sp - Rorcual común.

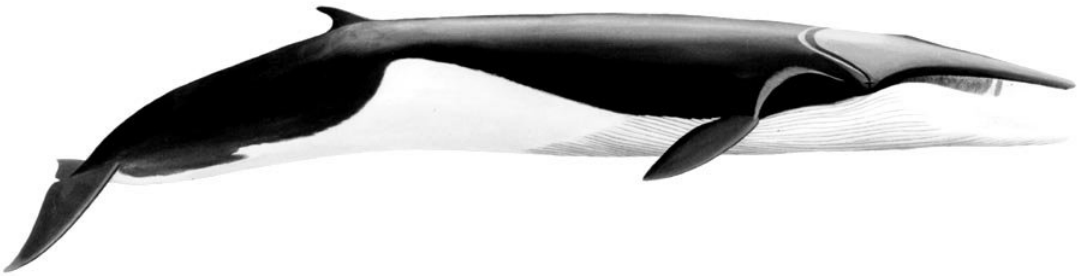
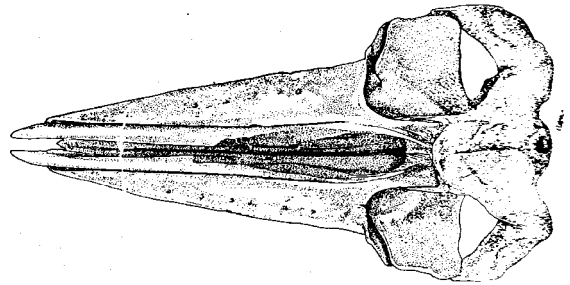


Fig. 162 *Balaenoptera physalus*

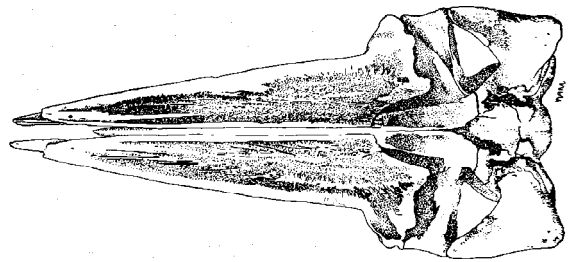
**Distinctive Characteristics:** Fin whales are large, but very sleek and streamlined. From above, the head is more pointed than that of the blue whale, and the dorsal fin tends to be taller, more falcate, and set farther forward on the tail stock than in the blue whale. The dorsal fin rises at a shallow angle from the animal's back.

The most distinctive feature of the fin whale, however, is its coloration. The body is black or dark brownish grey above and on the sides, and white below, but the head colour is asymmetrical. The left lower jaw is mostly dark, while the right jaw is largely white. There tend to be several light grey V-shaped "chevrons" on the back behind the head.

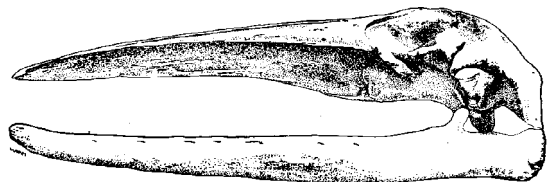
Fin whales have 260 to 480 baleen plates per side; the plates are dark, often striated with bands of grey and fringed with horizontal lines of yellowish white. Usually, the front one-half to one-third of the right side plates have more light pigmentation than those on the left. The 50 to 100 throat pleats are long, and reach to the navel. The thin blow is 4 to 6 m tall.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 163 Skull



Fig. 164 Surface - blow - dive profile

**Can be confused with:** The other 3 medium to large balaenopterids (blue [p. 50], sei [p. 54], and Bryde's [p. 56] whales) are likely to be confused with fin whales. Careful attention to colour pattern, head shape, and dorsal fin shape and position will help to distinguish them. The head of fin whales is much more pointed than that of blue whales, and the dorsal fin is set further back and rises at a shallower angle than those of sei or Bryde's whales. The best clue to identification, however, is the asymmetrical coloration of the head.

**Size:** Length at birth is 6 to 6.5 m. Adults can reach a maximum of 27 m in the Southern Hemisphere, but most Northern Hemisphere adults are less than 24 m long. Large animals may attain weights of up to 75 t.

**Geographical Distribution:** Fin whales inhabit primarily oceanic waters of both hemispheres. They are seen near shore, most commonly where deep water approaches the coast. Fin whales can be seen in tropical, temperate, and polar zones of all oceans.

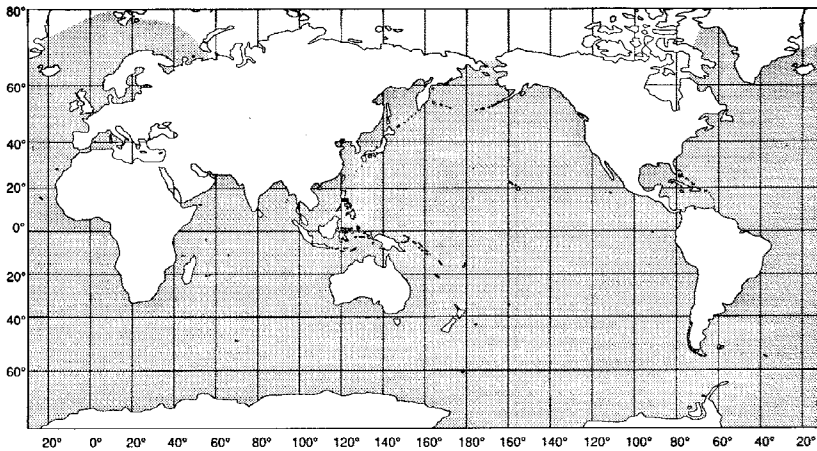


Fig. 165

**Biology and Behaviour:** Fin whales are capable of attaining high speeds, possibly to 37 km/h, making them one of the fastest great whales. They rarely raise their flukes on a dive, but they do occasionally breach. Fin whales tend to be slightly more social than other rorquals, gathering in pods of 2 to 7 whales, or more.

Young are born on breeding grounds in tropical and subtropical areas in mid winter.

Fin whales feed on small invertebrates, schooling fishes, and squid. They are active lunge feeders.

**Exploitation:** Following depletion of blue whale stocks, whalers shifted their attention to fin whales. Populations everywhere were substantially reduced. At present the worldwide population does not seem to appear in any immediate danger.

**IUCN Status:** Vulnerable.

***Balaenoptera borealis*** Lesson, 1828

BALAEN Bal 2

SIW

FAO Names: En - Sei whale; Fr - Rorqual de Rudolphi; Sp - Rorcual del norte.

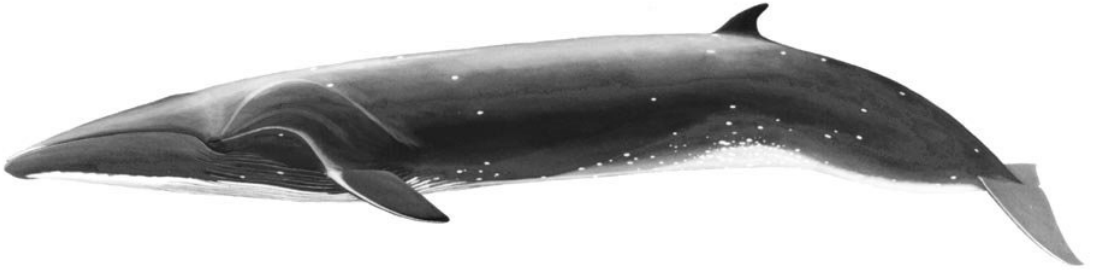
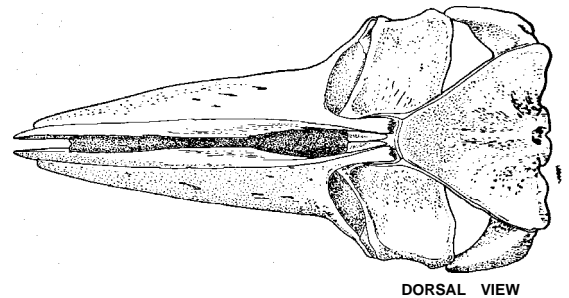


Fig. 166 *Balaenoptera borealis*

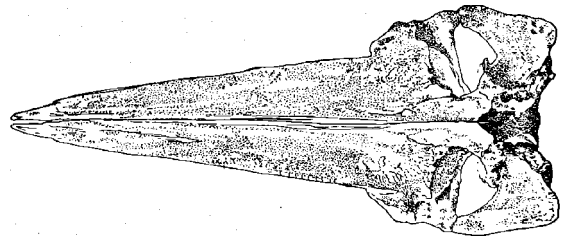
**Distinctive Characteristics:** Sei whales can be confused with fin and Bryde's whales, both of which also have a prominent falcate dorsal fin. All 3 have typical rorqual body shapes. In both sei and Bryde's whales, the dorsal fin rises at a steep angle from the back. However, sei whales have only a single prominent ridge on the rostrum (Bryde's whales tend to have 3), and a slightly arched rostrum with a downturned tip. Unless the head can be seen at close quarters, however, Bryde's and sei whales can be especially difficult to distinguish.

Coloration is mostly dark grey, except for a whitish area on the belly. The back is often mottled with scars (possibly from lamprey bites), and the skin surface often resembles galvanized metal.

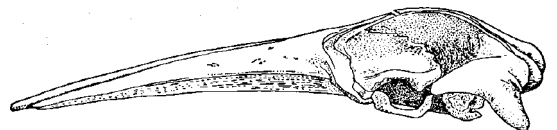
The 32 to 60 ventral pleats are short for rorquals, ending far ahead of the navel. The 219 to 402 baleen plates on each side are black with very fine fringes of light smoky grey to white. Sei whales produce a blow up to 3 m tall.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 167 Skull



Fig. 168 Surface - blow - dive profile

**Can be confused with:** Sei whales are most likely to be confused with Bryde's whales (p. 56), less likely with fin whales (p. 52). Attention to dorsal-fin shape and position, head shape, and colour patterns will help to distinguish among the 3. The 3 head ridges of Bryde's whales, and larger size and asymmetrical head coloration of fin whales will help make them distinguishable.

**Size:** Adults are up to 18 m in length. Large adults may weigh 30 t. At birth, sei whales are 4.5 to 4.8 m long.

**Geographical Distribution:** Sei whales are open ocean whales, not often seen near the coast. They occur from the tropics to polar zones in both hemispheres, but are more restricted to mid-latitude temperate zones than are other rorquals.

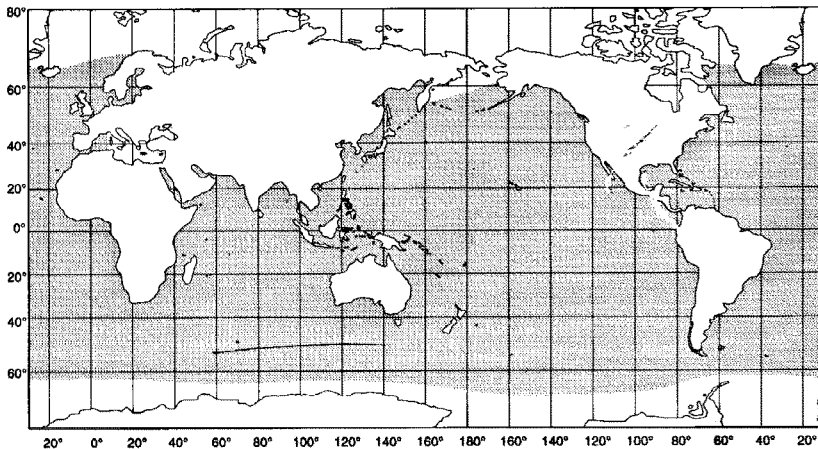


Fig. 169

**Biology and Behaviour:** Groups of 2 to 5 individuals are most commonly seen. Sei whales are fast swimmers, possibly the fastest of all cetaceans. When slow moving sei whales surface, their blowholes and dorsal fin are often visible above the water at the same time. Feeding sei whales tend to dive and surface in very predictable series, often remaining visible just below the surface between breaths.

Calving occurs in mid winter, in low latitude portions of the species' range.

Sei whales skim copepods and other small prey types, rather than lunging and gulping, like other rorquals. This may largely explain the relative fineness of the baleen fringes and the shortness of the throat pleats in this species.

**Exploitation:** As the larger rorquals became scarce in recent decades, hunting pressure on sei, Bryde's, and minke whales increased, largely in the Antarctic. Although heavily depleted, sei whales have recovered somewhat more successfully from hunting than other large baleen whales.

**IUCN Status:** Vulnerable.

***Balaenoptera edeni*** Anderson, 1878

BALAEN Bal 5

BRW

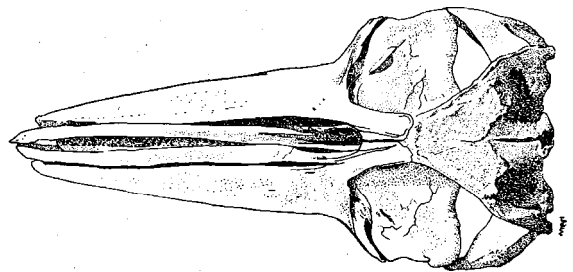
**FAO Names:** En - Bryde's whale; Fr - Rorqual de Bryde; Sp- Rorcual tropical.



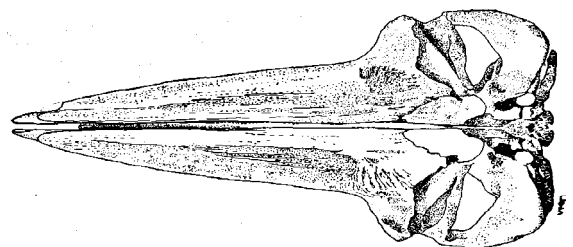
**Fig. 170 *Balaenoptera edeni***

**Distinctive Characteristics:** For many years, whalers and field observers did not distinguish between Bryde's and sei whales in their records. Now, however, whales of the 2 species can be, and are being, distinguished even at sea. Bryde's whales usually have 3 prominent ridges on the rostrum (other rorquals generally have only 1). This is perhaps the best characteristic to use, although one is best advised to consider information on other characters as well. The Bryde's whale's dorsal fin is tall and falcate and generally rises abruptly out of the back, a feature that will help distinguish this species (and sei whales) from fin whales, in which the dorsal fin rises at a relatively shallow angle from the back. The height of the blow is variable. Bryde's whales often exhale underwater, then surface with little or no blow.

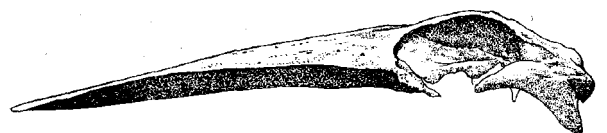
Bryde's whales are dark grey dorsally and lighter ventrally. The 40 to 70 throat pleats reach the navel. The 250 to 370 pairs of grey baleen plates have light grey fringes.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

**Fig. 171 Skull**

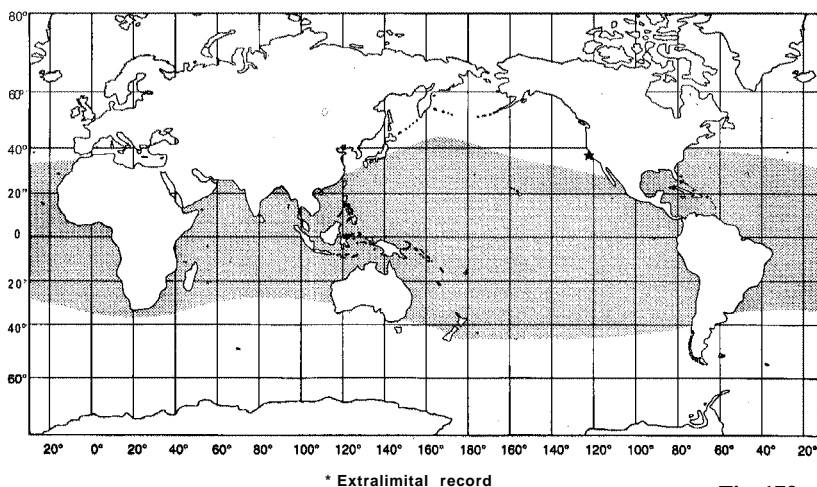


**Fig. 172 Surface - blow - dive profile**

**Can be confused with:** Bryde's whales can be easily confused with sei whales (p. 54). The presence of 3 head ridges confirms a whale's identity as a Bryde's whale (however, be aware that rippling water on the head of other species can be mistaken for accessory head ridges). Fin (p. 52) and minke (p. 58) whales can also cause some confusion; size (fin whales are larger and minke whales smaller), head shape, and coloration differences are the best characteristics to use.

**Size:** Adults can be up to 15.5 m long; newborns are about 4 m. Maximum weight is about 20 to 25 t. A smaller form has been described from some areas.

**Geographical Distribution:** Bryde's whales are creatures of the tropical and subtropical zones and generally do not move poleward of 40° in either hemisphere. They are found both offshore and near the coast in many areas. Whales of this species are not known to make extensive north to south migrations, though short migrations have been documented. Resident populations may be common in certain areas, such as the Gulf of California.



**Fig. 173**

**Biology and Behaviour:** Although generally seen alone or in pairs, Bryde's whales do aggregate into groups of 10 to 20 on feeding grounds.

Unlike other rorquals, the tropical Bryde's whale does not have a well-defined breeding season in most areas, and births can occur throughout the year.

Bryde's whales are primarily fish eaters, but they also take invertebrates. They are very active lunge feeders, often changing direction abruptly when going after mobile fish prey.

**Exploitation:** The history of whaling for Bryde's and sei whales is nearly impossible to separate, because these species were not consistently distinguished until recently. The Bryde's whale is one of the few great whales not listed as endangered.

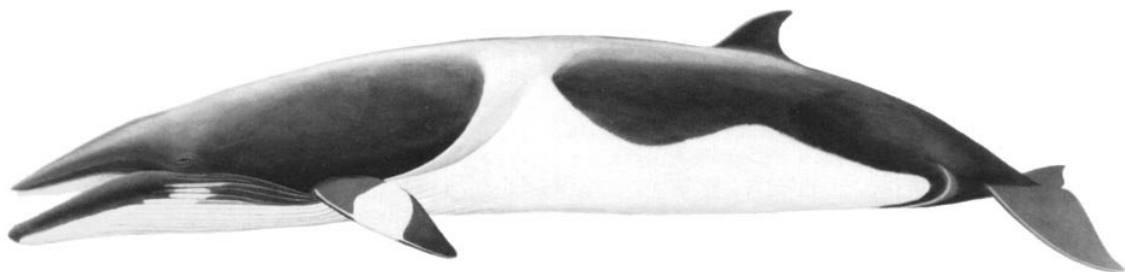
**IUCN Status:** Insufficiently known.

***Balaenoptera acutorostrata*** Lacepède, 1804

**BALAE** Bal 1

**MIW**

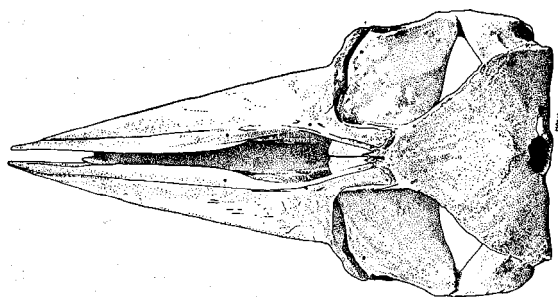
**FAO Names:** En - Minke whale; Fr - Petit rorqual; Sp - Rorcual enano.



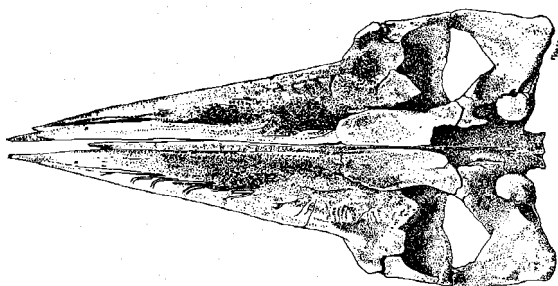
**Fig. 174 *Balaenoptera acutorostrata***

**Distinctive Characteristics:** Minke whales are generally easy to distinguish from the larger rorquals. The head is extremely pointed, viewed both from the side and from above, and the median head ridge is prominent. The dorsal fin is tall, recurved, and located about two-thirds of the way back from the snout tip. There are 30 to 70 moderately short ventral pleats (often extending just past the flippers) and 231 to 360 pairs of white to greyish baleen plates.

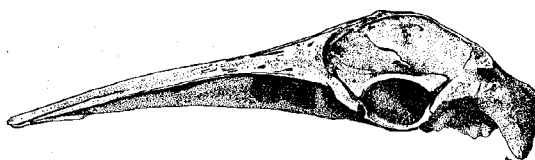
The minke's coloration is distinctive: dark grey dorsally and white beneath, with streaks or lobes of intermediate shades on the sides or both. Some of the streaks may extend onto the back behind the head. The most distinctive light marking is a brilliant white band across each flipper of Northern Hemisphere and some Southern Hemisphere minke whales (the band is not usually present on Antarctic animals). This band is generally visible through the water when animals are near the surface. The blow tends to be diffuse and is often not visible at all.



**DORSAL VIEW**



**VENTRAL VIEW**



**LATERAL VIEW**



Fig. 176 Surface · blow · dive profile

**Can be confused with:** When seen clearly, minke whales are probably the easiest to distinguish of the whales of the genus *Balaenoptera*, by their small size, usual absence of a visible blow, unique head shape, and distinctive colour patterns (especially the flipper bands). Sei (p. 54) and Bryde's whales (p. 56), and some beaked whales, may present identification problems, but generally only if the animals are seen at a distance.

**Size:** Adult minke whales reach just over 9 m in length (rarely some females may reach a maximum of 10.7 m). Maximum body weight is about 14 t. Length at birth is 2.4 to 2.8 m.

**Geographical Distribution:** Minke whales are widely distributed from the tropics to the ice edges in both hemispheres. Although they can be seen offshore as well, minke whales are more often seen in coastal and inshore areas. Minke whales are very rare in some tropical pelagic areas, such as the eastern tropical Pacific.

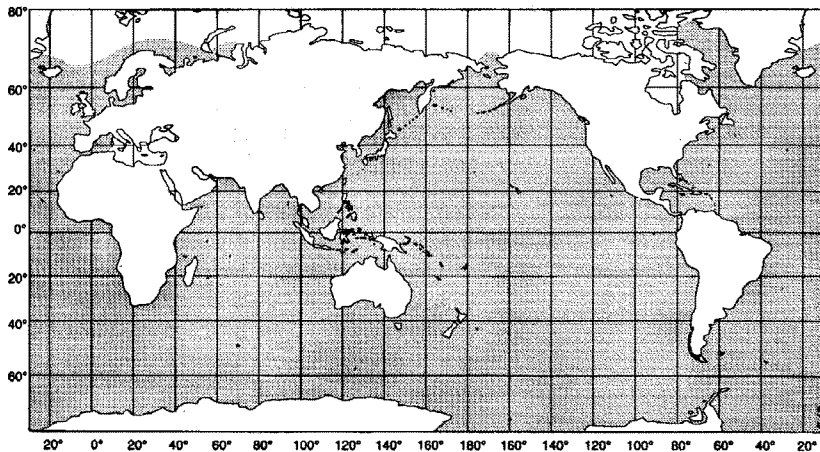


Fig. 177

**Biology and Behaviour:** Minke whales sometimes aggregate for feeding in coastal and inshore areas of cold temperate to polar seas. Although groups elsewhere are generally much smaller (singles, pairs, and trios), aggregations in the Antarctic may contain hundreds of animals. Minke whales do not fluke-up on a dive, but they do sometimes breach and perform other aerial behaviours.

Calving occurs in low latitude areas (although the migrations of minke whales are not as well-defined as those of larger rorquals) in winter months.

The prey types of minke whales are primarily krill and small schooling fishes.

**Exploitation:** For the last 2 decades, the minke whale has been the main target of the Antarctic whaling fleets. Although the IWC commercial whaling moratorium has afforded all great whales protection, a certain amount of "scientific whaling" continues and Norway recently resumed commercial whaling for this species. Japan also took some during recent Antarctic whaling seasons. The minke whale is the most abundant of all baleen whales.

**IUCN Status:** Insufficiently known.



***Megaptera novaeangliae*** (Borowski, 1781)

**BALAEN Meg 1**

**HUW**

**FAO Names:** En - Humpback whale; Fr - Baleine à bosse; Sp - Rorcual jorobado.

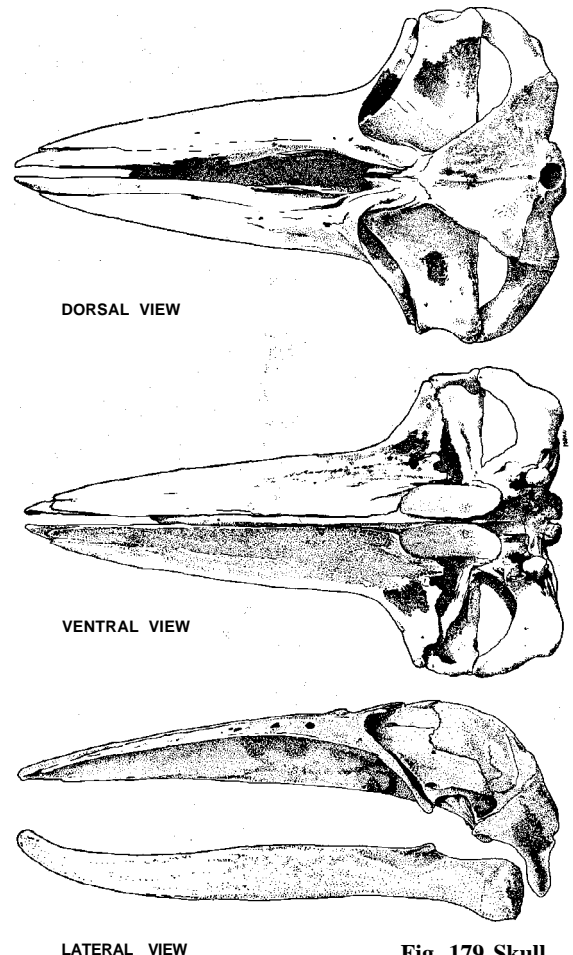


**Fig. 178 *Megaptera novaeangliae***

**Distinctive Characteristics:** The humpback whale differs substantially from the general rorqual body plan. The body is more robust; the flippers are extremely long (up to one-third of the body length) with a series of bumps, including 2 more prominent ones in consistent positions on the leading edge, more-or-less dividing the margin into thirds. The flukes have a concave, serrated trailing edge, and the dorsal fin is low and broad-based (usually sitting on a hump). The head has a single median ridge, and the anterior portion of the head is covered with many bumps (each containing a single sensory hair).

The body is black or dark grey dorsally and may be white ventrally, but the borderline between dark and light is highly variable and seems to differ by population (the white extends up onto the sides and back in some Southern Hemisphere humpbacks). The flippers are white on the ventral side and vary from all-white to mostly black on the dorsal surface. The ventral side of the flukes also varies from all-black to all-white.

There are 270 to 400 black to olive baleen plates, and 14 to 35 ventral pleats extending back to the navel or beyond. The blow is rather low and bushy for a balaenopterid, reaching only 3 m. It may sometimes appear V-shaped.



**Fig. 179 Skull**



Fig. 180 Surface - blow - dive profile

**Can be confused with:** At close range, the humpback is one of the easiest whales to identify. At a distance, however, there can be some confusion with other large whales, especially blue (p. 50) and sperm (p. 68) whales. When a closer look is obtained, humpbacks are generally unmistakable.

**Size:** Adult humpback whales are 11 to 16 m long and newborns are 4.5 to 5 m in length. Weights of at least 35 t are attained by adults.

**Geographical Distribution:** Humpbacks feed and breed in coastal waters, often near human population centres, and this helps make them one of the most familiar of the large whales. They migrate from tropics (breeding areas) to polar or sub-polar regions, reaching the ice edges in both hemispheres (feeding areas); their migrations take them through oceanic zones.

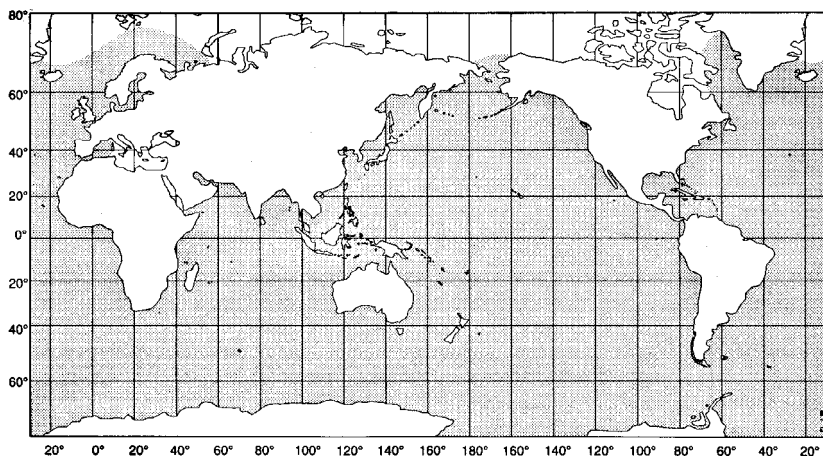


Fig. 181

**Biology and Behaviour:** Although they generally occur singly or in groups of 2 or 3, larger aggregations develop in feeding and breeding areas. Humpbacks are probably the most acrobatic of all great whales, sometimes performing full breaches that bring their entire bulk out of the water. They are adaptable lunge feeders, which use bubble nets, bubble clouds, tail flicks, and other techniques to help concentrate krill and small schooling fish for easier feeding. Sometimes humpbacks gather into coordinated groups of up to 20 or more whales, which work together to herd and capture prey. On the breeding grounds, males appear to compete for access to estrus females, apparently using their now well-known complex songs as part of their breeding display. Calves are born on wintering grounds in tropical and subtropical regions. Individual humpback whales can be identified using photographs of the distinctive markings on the undersides of their flukes. Such photos can be of great help in defining movements and migrations of this and other species.

**Exploitation:** Humpback whales were not a favorite target of Yankee whalers. However, because of their relatively slow swimming speeds and coastal habits, they were an early target of modern large-scale commercial whaling, beginning with shore based whaling in many areas. Since international protection in 1944, most stocks now appear to be stable or on the rise.

**IUCN Status:** Vulnerable.

***Eschrichtius robustus*** (Lilljeborg, 1861)

ESCH Esch 1

GRW

FAO Names: En - Gray whale; Fr - Baleine grise; Sp - Ballena gris.

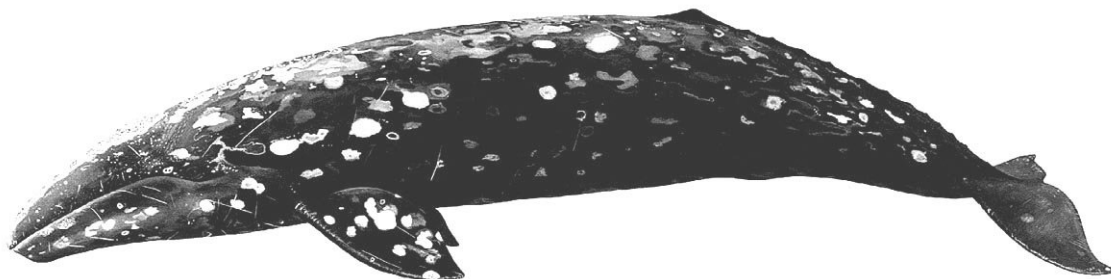
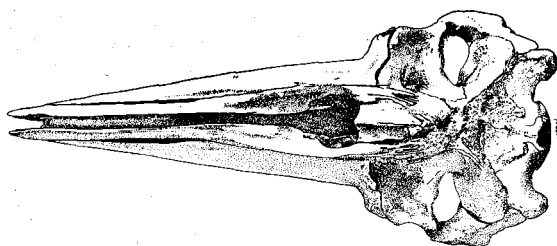


Fig. 182 *Eschrichtius robustus*

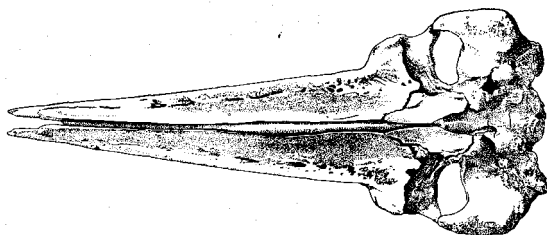
**Distinctive Characteristics:** Gray whales are easy to identify. They are intermediate in robustness between right whales and rorquals. The upper jaw is moderately arched, and the head is acutely triangular in top view and slopes sharply downward in side view. The flippers are broad and paddle-shaped, with pointed tips. The flukes have smooth S-shaped trailing edges, with a deep median notch. There is a dorsal hump about two-thirds of the way back from the snout tip, followed by a series of 6 to 12 smaller "knuckles" on the dorsal ridge of the tail stock. There may be several (generally 2 to 5) short, but deep, creases on the throat that allow compression of the throat during feeding.

Although young calves are dark charcoal grey, all other gray whales are brownish grey to light grey. They are nearly covered with light blotches and white to orangish patches of whale lice and barnacles, especially on the head and tail. These patches of ectoparasites are very helpful in distinguishing this species.

The mouth contains 130 to 180 pairs of yellowish baleen plates, with very coarse bristles. The blow is bushy, heart-shaped when viewed from ahead or behind, and rises less than 3 to 4 m.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 183 Skull

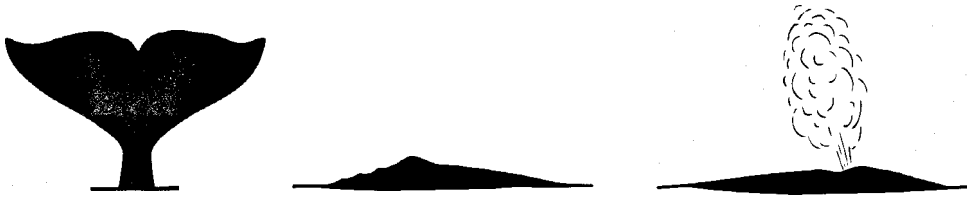


Fig. 184 Surface - blow - dive profile

**Can be confused with:** Gray whales are unique in body shape and patterning, and there is usually little problem with identification. From a distance, however, they can sometimes be confused with right (p. 42), bowhead (p. 46) sperm (p. 68) or humpback (p. 60) whales.

**Size:** At birth, gray whales are about 4.5 to 5 m long; adults are 11 to 15 m in length. Maximum body weight is over 35 t.

**Geographical Distribution:** Gray whales are found only in the North Pacific Ocean and adjacent seas. Gray whales are bottom feeders and are thus restricted to shallow continental shelf waters for feeding. In fact, they are the most coastal of all great whales, living much of their lives within a few tens of kilometres of shore (although they do feed great distances from shore on the shallow flats of the Bering and Chukchi seas). Gray whale stocks which previously occurred in the North Atlantic were wiped out by whalers in the seventeenth or eighteenth century.

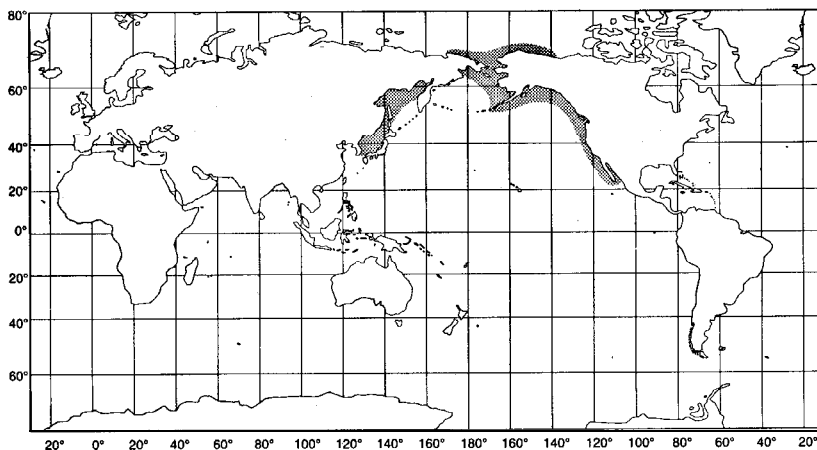


Fig. 185

**Biology and Behaviour:** Most groups are small, often with no more than 3 individuals, but gray whales do sometimes migrate in pods of up to 16, and larger aggregations are common on the feeding and breeding grounds. Breaching, spy-hopping, and other aerial behaviours are common, especially during migration, and in and near the breeding lagoons of Baja California and mainland Mexico. The migration from winter breeding grounds in Mexico to summer feeding grounds in the Bering, Chukchi, and occasionally Beaufort, seas is witnessed by tens of thousands of people each year along the west coast of North America. Breeding occurs in winter, during migration, and in or near the Baja California breeding lagoons. Gray whales feed primarily on swarming mysids and tube-dwelling amphipods in the northern parts of their range, but are also known to take red crabs, baitfish, and other food opportunistically.

**Exploitation:** The North Atlantic stock was apparently wiped-out by whalers in the 18th century. A western North Pacific (Korean) stock may also have been extirpated in the mid 20th century; its continued existence as a small remnant is still debated. The eastern North Pacific (California-Chukotka) stock nearly suffered the same fate twice, once in the late 1800s and again in the early 1900s. Both times, a respite in commercial whaling allowed the population to recover. About 170 to 200 from this latter stock are killed annually under special permit by commercial whalers on behalf of Soviet aborigines, and one or a few are taken in some years by Alaskan Eskimos. Since receiving IWC protection in 1946 and the end of research harvests in the late 1960s this population has increased, and now apparently equals or exceeds pre-exploitation numbers.

**IUCN Status:** Not listed.

## 2.4 SUBORDER ODONTOCETI - Toothed Whales

### ODONTOCETI

With the exception of the sperm whale (males of which can reach lengths of at least 18 m), odontocetes are small to medium-sized cetaceans. Sexual dimorphism is the rule. Toothed whales are characterized by the presence of teeth throughout life (although teeth are buried in the gum or jawbone in some species, worn or lost in others, and take peculiar shapes in still others), a single blowhole, an asymmetrical skull with a concave profile, a sternum with 3 or more parts, a complex system of nasal sacs, and a fatty organ in the forehead are called the melon. All are hypothesized to be capable of echolocation (i.e., producing specialized sounds, and receiving and processing the echoes from these sounds to navigate, find food, and avoid predators), although this ability has been experimentally verified for only a handful of species held successfully in captivity. Odontocetes take individual prey, which consists largely of fishes and squids.

### 2.4.1 Guide to Families of Toothed Whales

#### PHYSETERIDAE

**Sperm Whale** (1 species in 1 genus) p. 68

The sperm whale is the largest toothed cetacean and has the highest degree of sexual dimorphism. There is a low dorsal hump, followed by a series of crenulations. It has a large head with a squarish profile, narrow underslung lower jaw, and functional teeth only in the lower jaw (these fit into sockets in the upper jaw). The blowhole is located at the left front of the head. The head is highly modified, and is divided into sections called the "junk" and the spermaceti organ, or "case." The spermaceti organ is a large oil-filled reservoir, the function of which is controversial. Sperm whales have a dish shape to the facial area of the skull, extreme cranial asymmetry, and a long rostrum. Sperm whales are known to be capable of very deep, long dives.

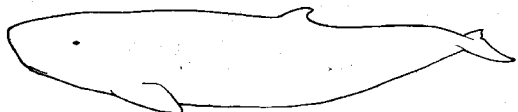


**Fig. 186** *Physeteridae*

#### KOGIIDAE

**Pygmy and Dwarf Sperm Whales** (2 species in 1 genus) p. 70

The pygmy and dwarf sperm whales are much smaller and share only a slight resemblance to the great sperm whale. They have blunt squarish heads, with underslung lower jaws (like their larger counterparts), but the head is much smaller than in the sperm whale, and the blowhole is not located at the front of the head as it is in the sperm whale. The skull structure is curious; it shares a basin-like facial area and great asymmetry with the sperm whale, but is much shorter. The dorsal fin in both species is larger than that of the sperm whale. The biology of these animals is very poorly known.

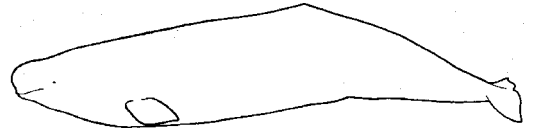


**Fig. 187** *Kogiidae*

## MONODONTIDAE

**Narwhal and White Whale** (2 species in 2 genera) p. 74

This is a family of small whales (less than 6 m in length), with stocky bodies, blunt bulbous heads, broad rounded flippers, and no dorsal fins. Both species are inhabitants of arctic and subarctic areas of the Northern Hemisphere. The skull is unique in that, in profile, it is very flat, with little or no rise in the area of the nares. Unlike the situation in most cetaceans, the cervical vertebrae are generally not fused, allowing monodontids a great range of neck flexibility.

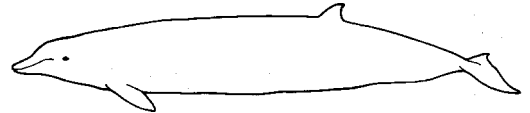


**Fig. 188 Monodontidae**

## ZIPHIIDAE

**Beaked Whales** (19 species in 5 genera) p. 78

The taxonomy of this group is unresolved and is currently under study. Although likely to change, there are 19 species currently recognized. The beaked whales are medium-sized cetaceans (4 to 13 m long), which as a rule, have reverse sexual dimorphism (females larger than males). In general, beaked whales have a pronounced beak, relatively small dorsal fin set far back on the body, small flippers that fit into depressions on the sides, 2 short throat grooves, flukes without a notch, and no more than 1 or 2 pairs of functional teeth in the lower jaw of males only (major exceptions are *Berardius*, in which females also have 2 pairs of exposed teeth, and *Tasmacetus*, in which both sexes have long rows of slender functional teeth). Beaked whales are poorly known as a rule; however, most are thought to be deep-diving squid feeders. They generally travel in small groups.

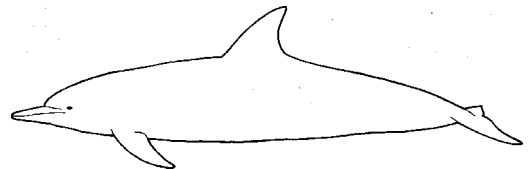


**Fig. 189 Ziphiidae**

## DELPHINIDAE

**Ocean Dolphins** (32 species in 17 genera) p. 118

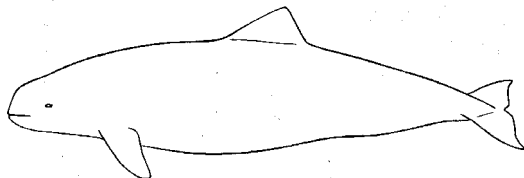
The family Delphinidae has been called a "taxonomic trash basket," because many small to medium-sized odontocetes of various forms have been lumped together in this group for centuries. Consequently, the so-called delphinids are diverse in form. They range in size from the 1 to 1.8 m dolphins of the genera *Sotalia* and *Cephalorhynchus* to the killer whale, in which males can reach lengths of at least 9.8 m. However, most delphinids share the following characteristics: a marine habitat, a noticeable beak, conical teeth, and a large falcate dorsal fin set near the middle of the back. There are exceptions to every one of these rules, except the presence of basically conical teeth.



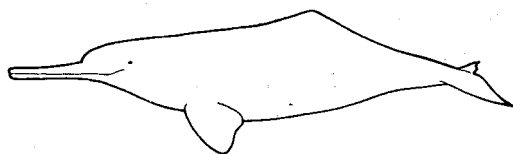
**Fig. 190 Delphinidae**

**PHOCOENIDAE****Porpoises** (6 species in 4 genera) p. 182

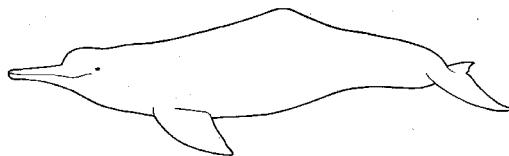
Porpoises (members of the family Phocoenidae) are small cetaceans (all less than 2.5 m) that some taxonomists classify with the dolphins. They tend to be coastal in distribution, rather stocky in form, with either a short indistinct beak or no beak at all. Most have a short triangular dorsal fin and all have spade-shaped teeth. In some species, females are larger than males. Phocoenids appear to live in smaller groups and have a simpler social structure than do most dolphins.

**Fig. 191 Phocoenidae****PLATANISTIDAE****Ganges and Indus River Dolphins** (2 species in 1 genus) p. 194

This family includes the susu and bhulan of the Ganges and Indus rivers, respectively. Animals in this family are nearly blind, and apparently rely largely on echolocation to navigate and find food. The body is small (to about 2.6 m) and "mushy." There is a long foreceps-like beak, with front teeth that extend outside the closed mouth. The blowhole is a longitudinal slit. The susu and bhulan have no true dorsal fin, only a low dorsal ridge. The most characteristic feature of the skull is a pair of enlarged maxillary crests that overhang the rostrum.

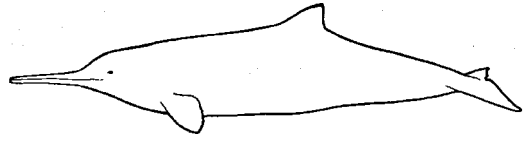
**Fig. 192 Platanistidae****INIIDAE****Boto** (1 species in 1 genus) p. 198

The single species in this family, the boto of the Amazon and Orinoco drainages in South America, is unique in several ways. It is a very large river dolphin, with a moderately long, thick snout dotted with sparse hairs. The dorsal ridge is very low and usually indistinct. Many adults are nearly totally pink in colour. The rear teeth are flattened and the zygomatic arches of the skull are incomplete.

**Fig. 193 Iniidae**

**PONTOPORIIDAE****Baiji and Franciscana** (2 species in 2 genera) p. 200

This family contains 2 types of dolphins, one a true river dolphin of the Yangtze River in China, the other a coastal marine species of the east coast of South America. Females are larger than males in both species. Both have long beaks (extremely so in the franciscana) and rather low, triangular dorsal fins.

**Fig. 194 Pontoporiidae**



2.4.2 FAO Species Identification Sheets

***Physeter catodon*** Linnaeus, 1758

PHYS Phys 1

SPW

Other scientific names still in use: *Physeter macrocephalus* Linnaeus, 1758.

FAO Names: En - Sperm whale; Fr - Cachalot; Sp - Cachalote.



Fig. 195 *Physeter catodon*

**Distinctive Characteristics:** The largest toothed cetacean, the sperm whale, is unlikely to be confused with any other species. The body is somewhat laterally compressed and the head is huge (one-quarter to one-third of the total head is huge an even greater proportion of the total bulk) and squarish when viewed from the side. The lower jaw is narrow and underslung. The single S-shaped blowhole is set at the front of the head and is offset to the left. The flippers are wide and spatulate, and the flukes are broad and triangular with a nearly straight trailing edge, rounded tips, and a deep notch. There is a low rounded dorsal hump and a series of bumps, or crenulations, on the dorsal ridge of the tail stock. The body surface tends to be wrinkled behind the head.

Sperm whales are predominantly black to brownish grey, with white areas around the mouth and often on the belly. Functional teeth (18 to 25 pairs that fit into sockets in the upper jaw) are present in the lower jaw only. The bushy blow projects up to 5 m and, because of the position of the blowhole, is directed forward and to the left. On windless days, such an angled blow is diagnostic.

Adult males and females can be distinguished not only by size differences, but also by the presence or absence of calluses on the dorsal hump. A large percentage of females (about 85%) have calluses, whereas males almost never have them.

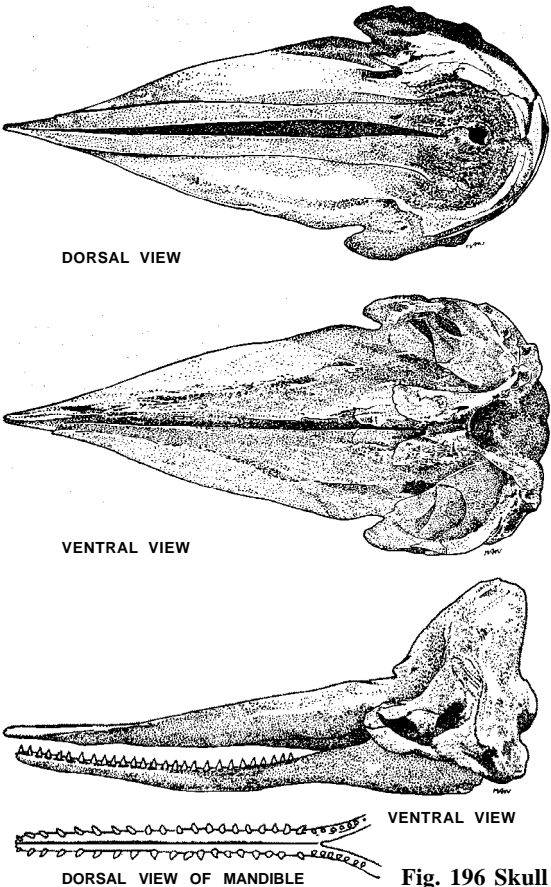


Fig. 196 Skull



Fig. 197 Surface - blow - dive profile

**Can be confused with:** Sperm whales are generally easy to distinguish from other large whales at sea, even at a great distance. The uniquely angled blow is diagnostic, but one must be careful to take into account the effects of wind on a whale's blow. Only humpbacks (p. 60), and possibly gray whales (p. 62), would likely be confused with sperm whales, and this only at a great distance.

**Size:** Newborn sperm whales are 3.5 to 4.5 m long. Adult females are up to 12 m and adult males are up to 18 m in length. Weights of up to 57 t have been recorded.

**Geographical Distribution:** Sperm whales are distributed from the tropics to the pack-ice edges in both hemispheres, although generally only large males venture to the extreme northern and southern portions of the range (poleward of 40° latitude). Deep divers, sperm whales tend to inhabit oceanic waters, but they do come close to shore where submarine canyons or other physical features bring deep water near the coast.

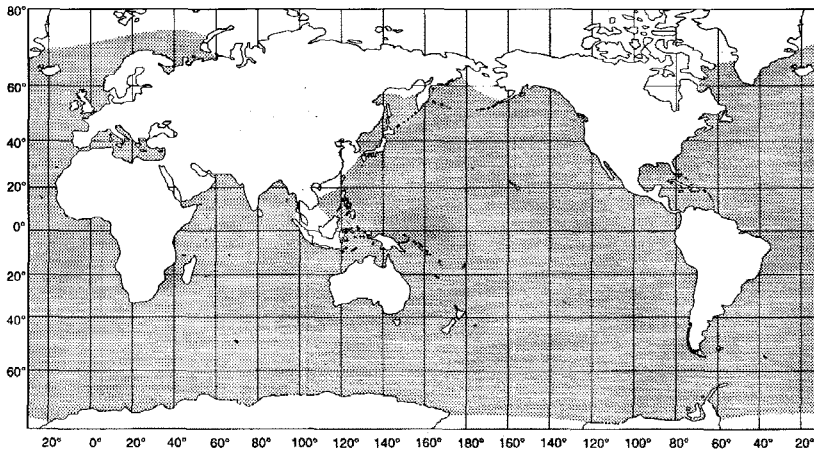


Fig. 198

**Biology and Behaviour:** Although bulls are sometimes seen singly (especially above 40° latitude), sperm whales are more often found in medium to large groups of up to fifty whales. Recently, the social system of sperm whales has been relatively well-studied. Apparently they are polygynous: adult males seem to employ a "searching" strategy for mating, associating with nursery groups of adult females and their offspring for only short periods of time. Sexually mature but non-breeding males that have been displaced from their maternal pods form bachelor herds. Most births occur in summer and autumn. Sperm whales are deep divers, apparently capable of reaching depths of 3 200 m or more. Some dives of bulls, which are longer than those of the smaller cows, last at least 2 hours. Fluking-up is common before a long dive. Low-frequency, stereotyped, clicked vocalizations, some of which are termed "codas," are apparently distinct to individual sperm whales and may act as acoustic signatures. Some clicks are also probably used in echolocation. An amazing variety of fish, cephalopods, and non-food items has been found in the stomachs of sperm whales from around the world. Cephalopods (squid and octopuses), however, are considered to be the major prey items.

**Exploitation:** Sperm whaling has a long history. The most intense periods were the "Yankee whaling" era of the 1800s and the factory ship whaling of the 20th century. Recent findings of studies on social behaviour and breeding undermine assumptions in the models on which exploitation and management have long been based. Certain populations have been depleted, but the sperm whale remains the most abundant of all the great whales (Great whales generally include the sperm whale and all baleen whales, except the pygmy right whale).

**IUCN Status:** Insufficiently known.

***Kogia breviceps*** (de Blainville, 1838)

KOGI Kog 1

PYW

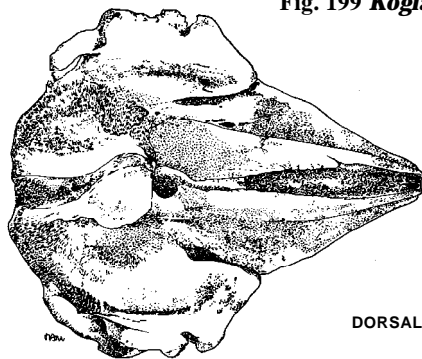
FAO Names: En - Pygmy sperm whale; Fr - Cachalot pygmée; Sp - Cachalote pigmeo.



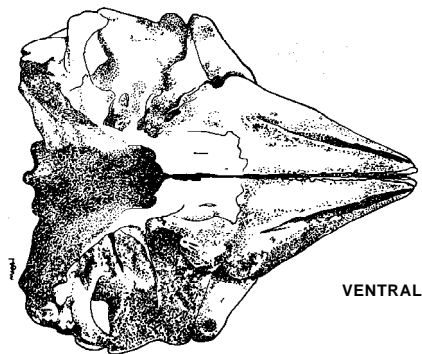
Fig. 199 *Kogia breviceps*

**Distinctive Characteristics:** Pygmy and dwarf sperm whales are very difficult to detect, except in extremely calm seas. Pygmy sperm whales have a shark-like head with a narrow underslung lower jaw. The flippers are set high on the sides near the head. The small falcate dorsal fin (< 5% of the body length) is usually set well behind the midpoint of the back.

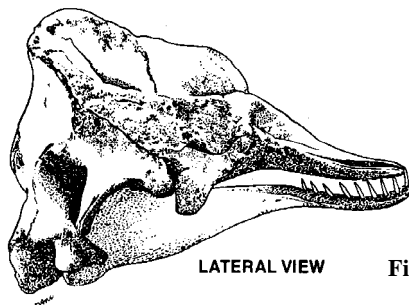
Pygmy sperm whales are countershaded, ranging from dark gray on the back to white below. Often the belly has a pinkish tone. There is a light coloured bracket mark, dubbed the "false gill," along the side between the eye and the flipper. The lower jaw contains 12 to 16 (sometimes 10 or 11) pairs of long, fang-like teeth that fit into sockets in the upper jaw. There are usually no teeth in the upper jaw.



DORSAL VIEW



VENTRAL VIEW



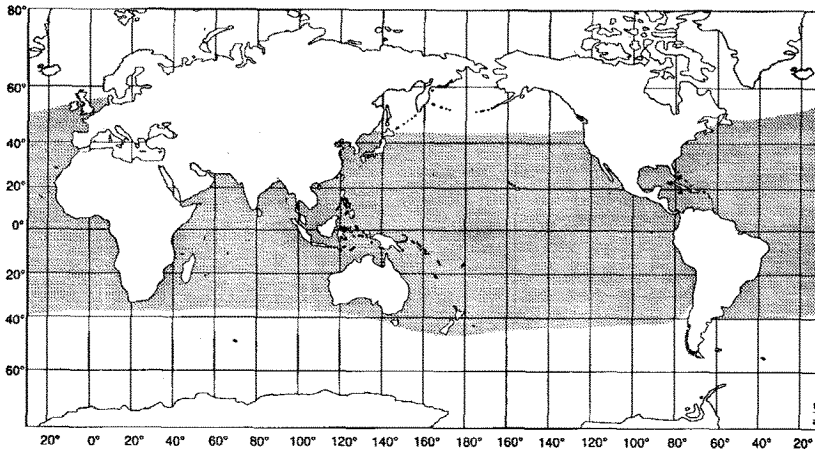
LATERAL VIEW

Fig. 200 Skull

**Can be confused with:** Pygmy and dwarf sperm whales (p. 70) are somewhat difficult to distinguish at sea. Pygmy sperm whales grow to somewhat greater total lengths, and have smaller, more rounded dorsal fins, set farther back on the body. There is some degree of overlap in most of characteristics of these 2 species, and identifications must be made cautiously.

**Size:** Adult pygmy sperm whales are 2.7 to 3.4 m long, and newborns are about 1.2 m. Adults may weigh as much as 400 kg.

**Geographical Distribution:** Pygmy sperm whales are known from deep waters in tropical to warm temperate zones of all oceans. They appear to be especially common over and near the continental slope.



**Fig. 201**

**Biology and Behaviour:** Most sightings of pygmy sperm whales are of small groups of less than 5 or 6 individuals. Almost nothing is known of the behaviour and ecology of this species. They are rarely seen alive at sea, but they are among the most frequently stranded small whales in some areas. When seen at sea, they generally appear slow and sluggish, with no visible blow.

Very little is known of the reproductive biology of the pygmy sperm whale.

Studies of feeding habits, based on stomach contents of stranded animals, suggest that this species feeds in deep water on cephalopods and, less often, on deep-sea fishes and shrimps.

**Exploitation:** Pygmy sperm whales have never been hunted commercially. In recent years, however, a few have been killed in Sri Lanka's gillnet fisheries, and it is likely they are killed in gillnets elsewhere as well. Small numbers have been taken in coastal whaling operations off Japan and Indonesia.

**IUCN Status:** Insufficiently known.

***Kogia simus*** Owen, 1866

KOGI Kog 2

DWW

**FAO Names:** En - Dwarf sperm whale; Fr - Cachalot nain; Sp - Cachalote enano.

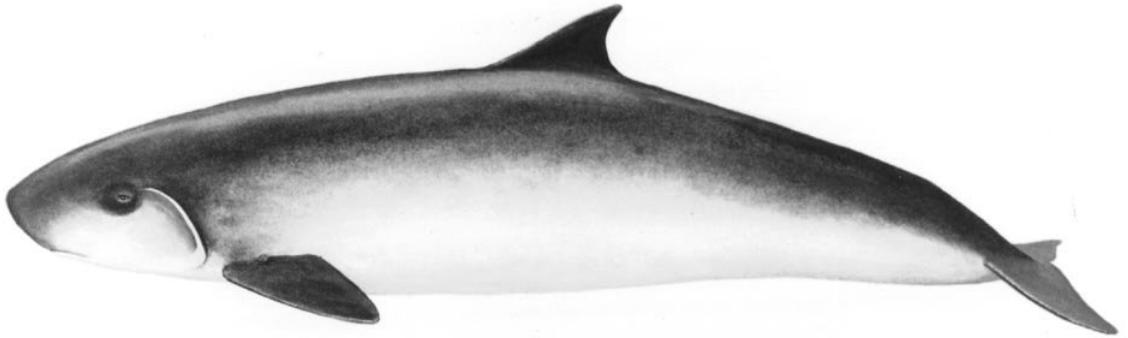
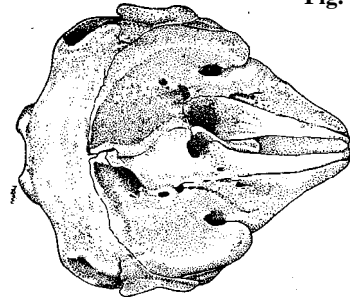


Fig. 202 *Kogia simus*

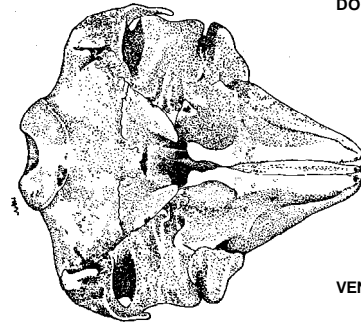
**Distinctive Characteristics:** The dwarf sperm whale is similar in appearance to the pygmy sperm whale, but has a larger dorsal fin (> 5% of the body length), generally set nearer the middle of the back. Like its congener, the dwarf sperm whale has a shark-like profile (but with a more pointed snout than the pygmy sperm whale).

Dwarf sperm whales have grey (dorsal) to white (ventral) coloration, and a pigment marking shaped like a shark's gill slit on the side of its head. Generally, a pair of short grooves, similar to those in beaked whales, is present on the throat.

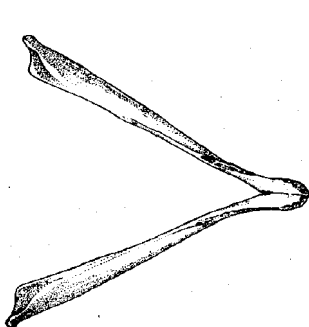
There are 8 to 11 (rarely up to 13) pairs of teeth in the lower jaw; sometimes teeth are present in the upper jaw as well.



DORSAL VIEW



VENTRAL VIEW



DORSAL VIEW OF MANDIBLE



LATERAL VIEW

Fig. 203 Skull

**Can be confused with:** Dwarf sperm whales are most likely to be confused with pygmy sperm whales (p. 70), which are very similar in appearance. Besides reaching smaller maximum lengths, dwarf sperm whales have taller, more dolphin-like dorsal fins, set more toward the middle of the back. However, because sizes overlap and dorsal fins are variable in size and position, many sightings at sea of Kogia whales may not be identifiable to species.

**Size:** Adults of this species are up to 2.7 m long and may weigh up to 210 kg. Length at birth is about 1 m.

**Geographical Distribution:** The dwarf sperm whale, like the pygmy sperm whale, is known mostly from strandings. It has rarely been positively identified in encounters at sea. It appears to be distributed widely in tropical to warm temperate zones, apparently largely offshore.

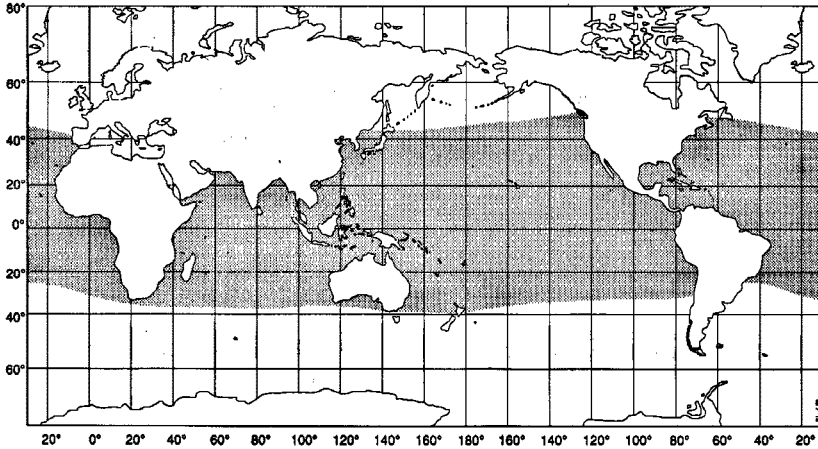


Fig. 204

**Biology and Behaviour:** Group sizes tend to be small, most often less than 5 individuals (although groups of up to 10 have been recorded). This species, like the pygmy sperm whale, is also shy and undemonstrative when observed at sea. When startled, dwarf sperm whales, and possibly pygmy sperm whales, may leave a large rust-coloured cloud of fecal material behind as they dive.

In at least one area, there appears to be a calving peak in summer.

Dwarf sperm whales appear to feed primarily on deep-water cephalopods.

**Exploitation:** Some small scale catches of dwarf sperm whales have occurred in Japan and in St. Vincent in the Lesser Antilles. Also, substantial numbers appear to be taken each year in gillnets in the Indian Ocean, and possibly elsewhere.

**IUCN Status:** Insufficiently known.

***Monodon monoceros*** Linnaeus, 1758

MONO Mono 1

NAR

FAO Names: En - Narwhal; Fr - Narval; Sp - Narval.

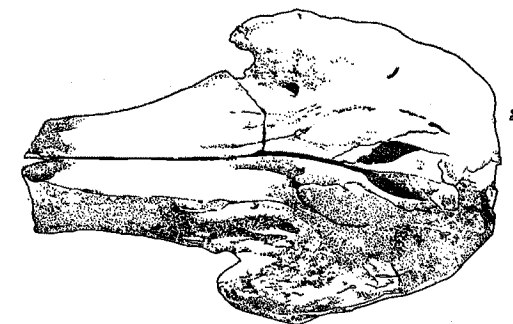


Fig. 205 *Monodon monoceros*

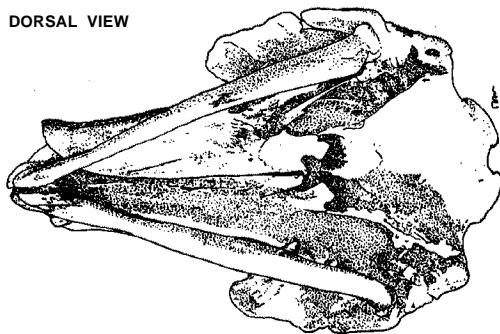
**Distinctive Characteristics:** Narwhals are characterized by a robust body, relatively small, bulbous head with little or no beak, short blunt flippers that turn up at the tips in adults, absence of a dorsal fin (however, a slight dorsal ridge is present), and oddly shaped flukes. The flukes of adults become straight to concave on the leading edge, and convex on the trailing edge. They are deeply notched and the tips tend to curl upwards, especially in older animals.

Young narwhals are uniformly grey to brownish grey. As the animals age, black mottling develops on the back and sides, and the belly becomes light grey to white (with some dark mottling). Older animals often appear nearly white, with some black still remaining on the appendages.

There are only 2 teeth, both in the upper jaw. In females, these almost always remain embedded in the upper jaw bones, but in males the left tooth normally grows out through the front of the head and becomes a tusk up to 3 m long. Occasionally, females with a tusk or males with 2 erupted tusks are seen.



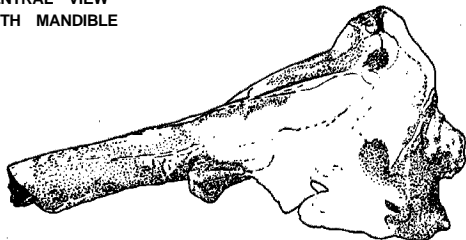
DORSAL VIEW



VENTRAL VIEW  
WITH MANDIBLE



TUSK



LATERAL VIEW



Fig. 206 Skull

**Can be confused with:** The narwhal is likely to be confused only with the white whale (p. 76). Young white whales, especially, can look like narwhals, because of their grey coloration. The absence of blotching on white whales is probably the best guide, and male narwhals can be easily distinguished by their tusks.

**Size:** Adult females can be up to 4.2 m and males up to 4.7 m long (exclusive of the tusk). Large narwhals can reach weights of up to 1 600 kg. Narwhals are about 1.6 m long at birth.

**Geographical Distribution:** This is an arctic species; it is found mostly above the Arctic Circle year-round. The principal distribution of the narwhal is from the central Canadian Arctic, eastward to Greenland and to the central Russian Arctic. They are rarely observed in the eastern Russian Arctic, Alaska, or the western Canadian Arctic. There are annual migrations, primarily to open water in autumn and back to inshore waters in spring. Three stocks are recognized on the basis of distribution and migration patterns.

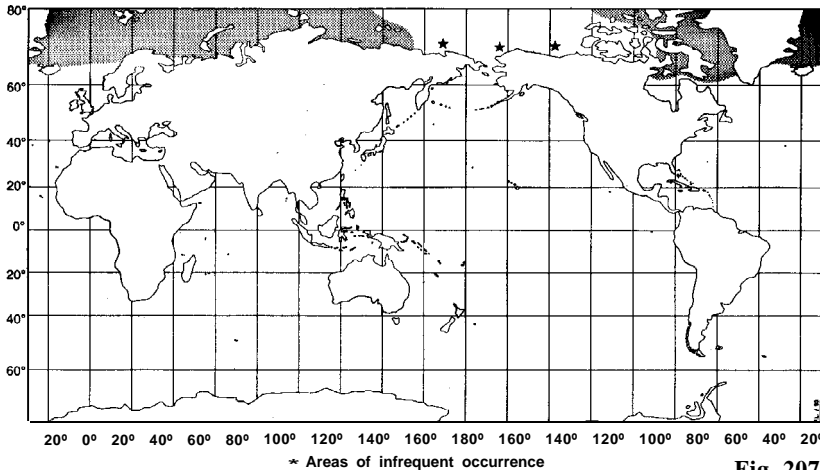


Fig. 207

**Biology and Behaviour:** Most pods of narwhals consist of 2 to 10 individuals, but there is some evidence that these groups are often parts of large dispersed herds of hundreds or even thousands of individuals. There is some age and sex segregation of narwhal groups, and all-male groups are common.

The tusk of male narwhals has long been a source of controversy. It now is generally agreed that the tusk is used in male-to-male, competition for females. It is used perhaps primarily as a display, although male narwhals have been seen "sparring" with their tusks held above water.

Young narwhals are born mainly in summer, from July through August.

Fish, squid, and shrimp make up most of the narwhal's diet. They feed, at times, in deep water and possibly at or near the bottom.

**Exploitation:** Narwhals have been hunted for many centuries, both by Eskimos and by Europeans. Often sold for a high price as the horn of a unicorn, the tusk was, and still is, a much sought-after prize. No strictly commercial hunting occurs today; however, narwhals are still hunted for "subsistence" by Canadian and Greenlandic natives. Throughout the 1980s, the annual kill was estimated to be less than 1 000 individuals. Oil and gas activities and pollution are other potential threats to narwhal populations.

**IUCN Status:** Insufficiently known.

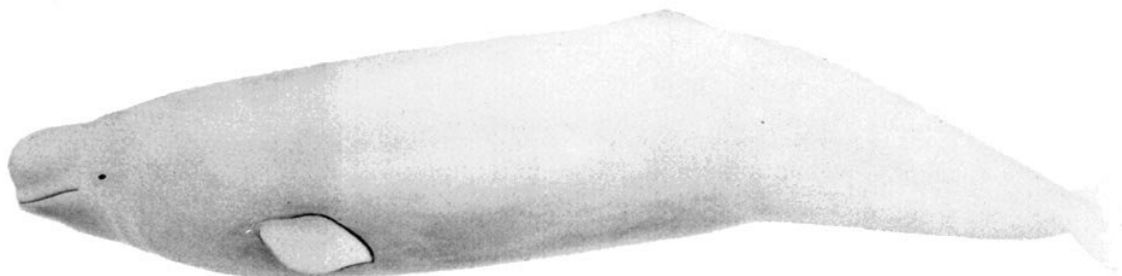


***Delphinapterus leucas*** (Pallas, 1776)

MONO Delph 1

BEL

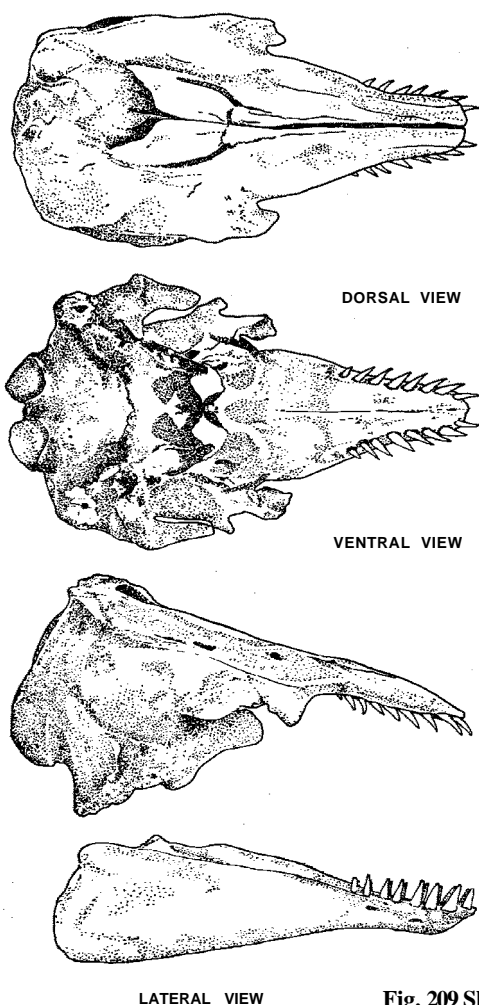
FAO Names: En - White whale; Fr - Bélouga; Sp - Beluga.

Fig. 208 *Delphinapterus leucas*

**Distinctive Characteristics:** The white whale, or beluga, is a robust animal. Its basic body shape is much like that of the narwhal; it has a small bulbous head with only a very short beak, no dorsal fin (instead, a shallow transversely nicked ridge runs along the midline of the back), small rounded flippers (with curled tips in adult males), and flukes that often have a convex trailing edge. White whales are “blubbery”; their bodies are supple and often wrinkled. There is often a visible neck. Because the cervical (neck) vertebrae are not fused, white whales can move their necks more than most other cetaceans.

At birth, white whales are dark grey to brownish grey. They whiten increasingly as they age, reaching the pure white stage between 5 and 12 years of age.

The mouth generally contains 9, often heavily worn, teeth in each row of the upper jaw, and 8 in each row of the lower jaw.



LATERAL VIEW

Fig. 209 Skull

**Can be confused with:** White whales can be confused with narwhals (p. 74), which overlap in much of their range. The blotchy grey colour of narwhals, and the tusks of males of this species, should permit proper identification in most situations.

**Size:** Most adult white whales are less than 5.5 m (males) or 4.1 m (females), and large animals may weigh up to 1 600 kg. Calves average about 1.6 m at birth.

**Geographical Distribution:** White whales are found only in high latitudes of the Northern Hemisphere. They are widely distributed throughout the arctic and subarctic regions, mostly in shallow coastal waters; however, they do move into deep, offshore waters at times. White whales enter estuaries, and even rivers; there are a few records of solitary individuals ranging thousands of kilometres up various rivers. At least 15 stocks of white whales have been recognized, based on morphological, genetic, and distribution differences.

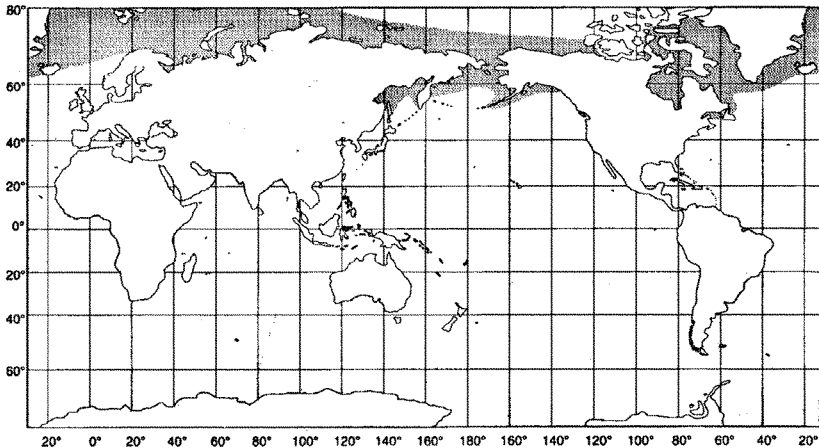


Fig. 210

**Biology and Behaviour:** The highly gregarious white whale is most often found in groups up to about 15 individuals, but it is sometimes seen in aggregations of thousands. Pods are often segregated by age and sex; all-male groups and mixed aggregations, including females and young, are known.

In general, white whales are not showy at the surface and they do not often leap. These animals generally swim slowly. During the summer, they aggregate in large numbers in shallow estuaries, and at these times are very active. Their extreme loquaciousness has earned them the name "sea canary."

Calves are born in spring to summer, between April and August, depending on the population.

Although various species of fish are considered to be the primary prey items, white whales also feed on a wide variety of mollusks and benthic invertebrates. Based on stomach contents, white whales are thought to feed mostly on or near the bottom.

**Exploitation:** There is a long history of direct hunting, both subsistence and commercial, of white whales by native peoples, Russians and Europeans. Commercial hunting is now uncommon, and most belugas are taken by natives for food. Recent catches by Alaskan, Canadian, Greenlandic, and Russian people combined, total several thousand per year. However, the population in most danger is no longer hunted. Beluga numbers in the St. Lawrence Estuary have declined, and the population is threatened primarily by the effects of chemical pollution. In other parts of their range, oil and gas activities have been a source of concern.

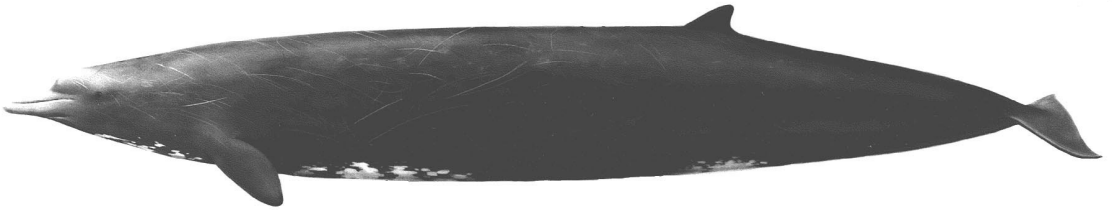
**IUCN Status:** Insufficiently known.

***Berardius bairdii*** Stejneger, 1883

ZIPH Ber 2

BEW

**FAO Names:** En - Baird's beaked whale; Fr - Baleine a bec de Baird; Sp - Zifio de Baird.



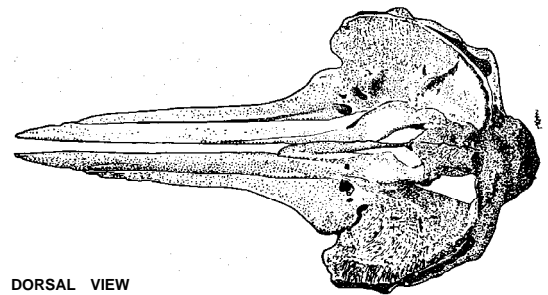
**Fig. 211 *Berardius bairdii***

**Distinctive Characteristics:** Baird's beaked whales are the largest whales in the ziphiid family. They have a long, well-defined, tube-like beak and a rounded forehead (rising at a shallower angle than in bottlenose whales, *Hyperoodon* spp.). The body is relatively more slender than in bottlenose whales. The small, but prominent, triangular dorsal fin is about two-thirds of the way along the back and is rounded at the tip. There is the usual V-shaped pair of throat grooves characteristic of beaked whales. Though some animals have a median notch on the flukes, most have no notch (and some even have a bulge).

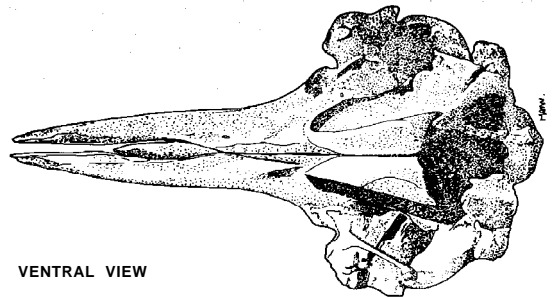
Baird's beaked whales are dark brownish grey, usually heavily scarred with light scratches or splotches on the back and, often, on the undersides.

There are 2 pairs of teeth near the tip of the lower jaw. The forward pair of teeth in adults is visible at the tip of the protruding lower jaw, even when the mouth is closed. On some individuals, these teeth are heavily infested with barnacles.

The conspicuous blow is low and rounded, and is often given in rapid succession.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW WITH MANDIBLE

**Fig. 212 Skull**

**Can be confused with:** Several of the other beaked whales (Cuvier's beaked whale [p. 82] and some species of *Mesoplodon* [starting on p. 90]) are found within the Baird's beaked whale's range, but the larger adult size and unique head and dorsal fin of the latter species should make them identifiable. Minke whales (p. 58) could, in some circumstances, be confused with Baird's beaked whales; when a good look is obtained, differences in dorsal-fin shape, head shape, and coloration make the 2 easily distinguishable.

**Size:** Baird's beaked whales reach lengths of 11.9 m (males) and 12.8 m (females), and weights of up to 12 000 kg. They are about 4.5 m long at birth.

**Geographical Distribution:** Baird's beaked whales are found in deep oceanic waters of the North Pacific Ocean and the Japan, Okhotsk, and Bering seas. Their range extends to the southern Gulf of California in the eastern Pacific, and to the island of Honshu, Japan, in the western Pacific. Though they may be seen close to shore where deep water approaches the coast, their primary habitats appear to be over or near the continental slope and oceanic seamounts.

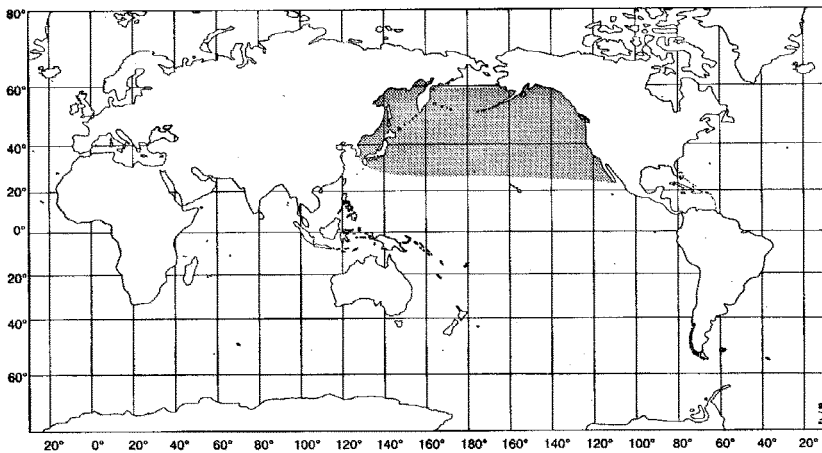


Fig. 213

**Biology and Behaviour:** Baird's beaked whales live in pods of 5 to 20 whales, although groups of up to 50 are occasionally seen. They often assemble in tight groups drifting along at the surface. At such times, snouts are often seen as animals slide over one another's backs. They are deep divers, capable of staying down for over an hour. From Japanese whaling data, it appears that males live longer than females and that females have no post-reproductive stage. There is a calving peak in March and April.

Baird's beaked whales feed mainly on deepwater and bottom-dwelling fish, cephalopods, and crustaceans.

**Exploitation:** Until the 1960s and 1970s Baird's beaked whales in the eastern North Pacific were taken only by United States and Canadian whalers (in relatively small numbers). In the western North Pacific, there has been heavier exploitation by the Soviets and Japanese. Japan's coastal whaling stations continue to take up to 40 Baird's beaked whales per year. Some Baird's beaked whales have been caught in Japanese salmon driftnets.

**IUCN Status:** Insufficiently known.

***Berardius arnuxii*** Duvernoy, 1851

ZIPH Ber 1

BAW

**FAO Names:** En - Arnoux's beaked whale; Fr - Beradien d'Arnoux; Sp - Ballenato de Arnoux.

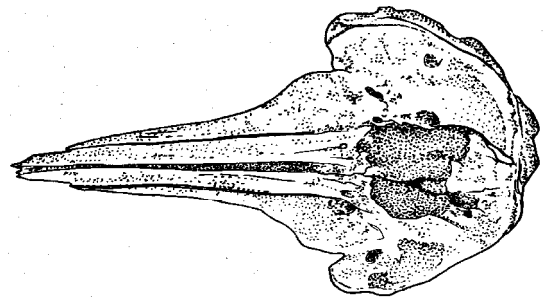


Fig. 214 *Berardius arnuxii*

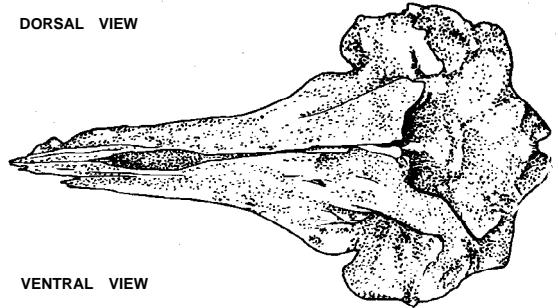
**Distinctive Characteristics:** Similar in appearance to Baird's beaked whale, this species has a small head, with a long tube-like beak, moderately steep bulbous forehead, small rounded flippers, short slightly falcate dorsal fin, and (usually) un-notched flukes. A pair of V-shaped throat grooves is present.

Arnoux's beaked whales are slate grey to light brown; the head region is generally lighter than the rest of the body. The body is often heavily scarred and scratched, and the underside tends to be lighter, and covered with white blotches.

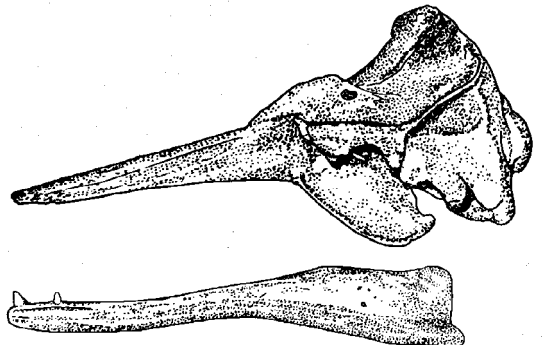
Two pairs of triangular teeth are present at the tip of the lower jaw; they erupt in both sexes and are visible outside the closed mouth. The pair nearest the tip of the jaw is larger.



DORSAL VIEW



VENTRAL VIEW



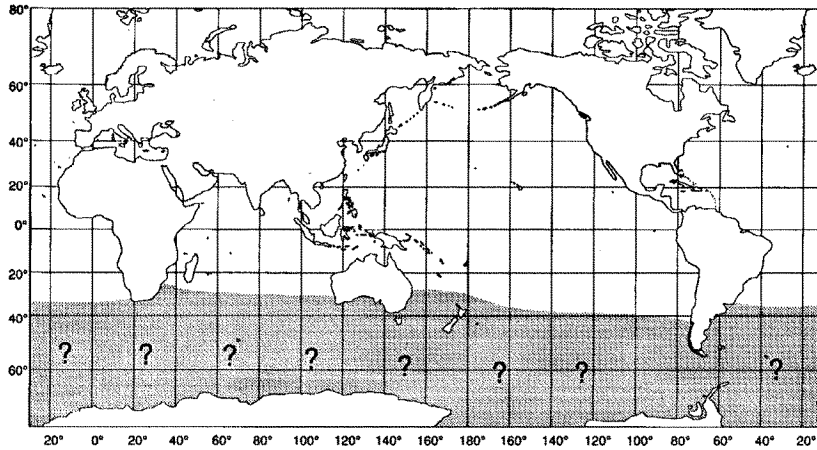
LATERAL VIEW

Fig. 215 Skull

**Can be confused with:** Arnoux's beaked whales can be easily confused with southern bottlenose whales (p. 86), which share much of their range. Differences in head shape, dorsal-fin shape, and tooth size and position should be sufficient to distinguish them, if clearly seen. Individuals of some species of *Mesoplodon* (starting on p. 90) could also be confused with this species, but they are generally much smaller.

**Size:** Arnoux's beaked whales reach a known maximum size of 9.75 m; females are probably larger than males, as is generally true in beaked whales. Length at birth is unknown, but is probably around 4 m.

**Geographical Distribution:** Although this species probably has a circumpolar distribution in deep cold temperate and subpolar waters of the Southern Hemisphere, most records are from the southeast coast of South America, near the Antarctic Peninsula, South Africa, and the Tasman Sea.



**Fig. 216**

**Biology and Behaviour:** Not much is known of the biology of this species. Most groups number between 6 and 10 individuals, but some as large as 80 whales have been seen. Arnoux's beaked whales are reportedly shy of boats and can dive for over an hour, making observation difficult.

This species' reproductive biology is poorly known.

The feeding habits of Arnoux's beaked whales are assumed to be similar to those of their Northern Hemisphere relatives, Baird's beaked whales, thus consisting of benthic and pelagic fishes and cephalopods.

**Exploitation:** There has not been any substantial commercial hunting for this species, but some have been taken for scientific study.

**IUCN Status:** Insufficiently known.

***Ziphius cavirostris*** Cuvier, 1823

ZIPH Ziph 1

BCW

**FAO Names:** En - Cuvier's beaked whale; Fr - Ziphius; Sp - Zifio de Cuvier.

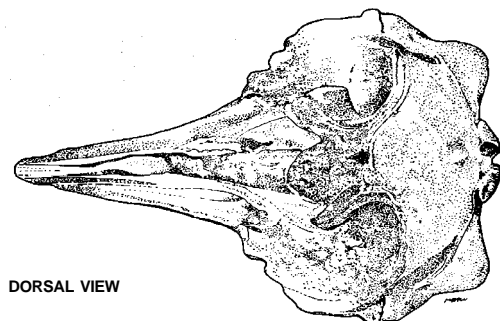


**Fig. 217 *Ziphius cavirostris***

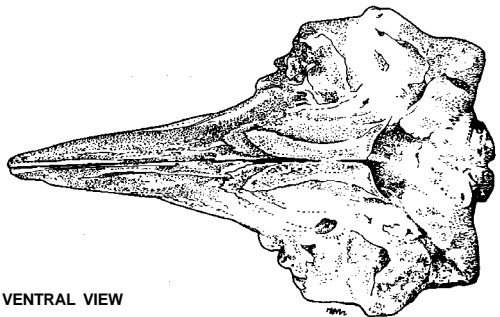
**Distinctive Characteristics:** Cuvier's beaked whales are relatively robust, as beaked whales go. They have a short, poorly defined beak, and a mouthline that is upcurved at the rear. A pair of V-shaped throat grooves is present. A diagnostic feature is the slight concavity on the top of the head, which becomes increasingly more noticeable in older animals. A fluke notch is sometimes present. The dorsal fin is small and falcate, and is set about two-thirds of the way back from the snout tip.

The body is dark grey to light rusty brown, with lighter areas around the head and belly. The head and much of the back of adult males can be completely white. Generally, adults are covered with light scratches and circular marks.

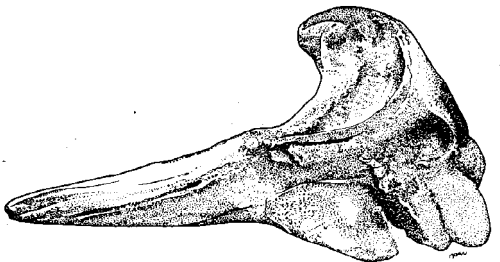
There is a single pair of forward-pointing conical teeth at the tip of the lower jaw; they generally erupt only in adult males and are exposed outside the closed mouth in large bulls.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW



**Fig. 218 Skull**

**Can be confused with:** This species is most likely to be confused with other beaked whales, especially species of *Mesoplodon* (starting on p. 90). The robust body, blunt head, and lighter coloration (especially around the head, and in adult males) may be sufficient to distinguish Cuvier's beaked whales, if seen. Whales of the genera *Hyperoodon* (starting on p. 84) and *Berardius* (starting on p. 78) are larger and have more bulbous foreheads and long tube-like snouts.

**Size:** Length at birth is about 2.7 m; adults reach 7.5 m (males) and 7 m (females). Maximum recorded weight is nearly 3 000 kg.

**Geographical Distribution:** Cuvier's beaked whales are widely distributed in offshore waters of all oceans, from the tropics to the polar regions. They may have the most extensive range of any beaked whale species, and are fairly common in certain areas, such as the eastern tropical Pacific.

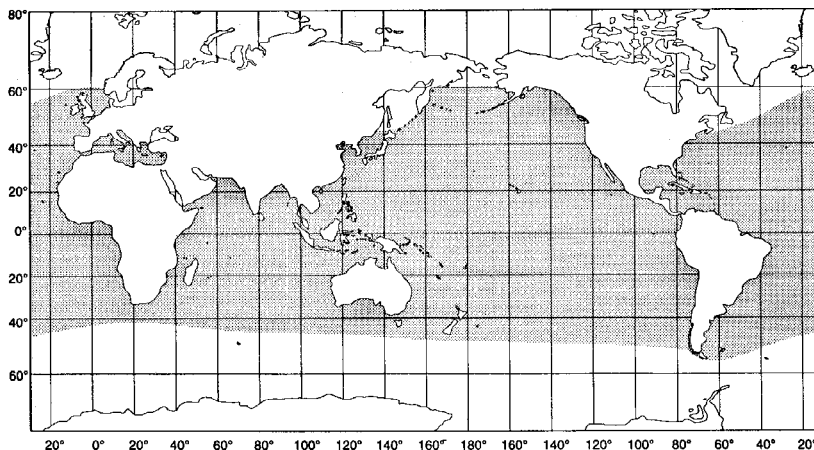


Fig. 219

**Biology and Behaviour:** This species tends to be rather inconspicuous in its behaviour. Dives of up to 40 minutes have been documented. Cuvier's beaked whales are found mostly in small groups of 2 to 7, but are not uncommonly seen alone.

Seasonality of calving is not known in this species.

Cuvier's beaked whales, like all beaked whales, appear to prefer deep water; they feed mostly on deep sea squid, but also take fish and some crustaceans.

**Exploitation:** There have been no major fisheries for this species, although small numbers have been taken deliberately in Japan, the Lesser Antilles, and the Mediterranean, and incidentally elsewhere.

**IUCN Status:** Insufficiently known.



***Hyperoodon ampullatus*** (Forster, 1770)

ZIPH Hyp 2

BOW

**FAO Names:** **En** - Northern bottlenose whale; **Fr** - Hyperoodon boreal; **Sp** - Ballena nariz de botella del norte.

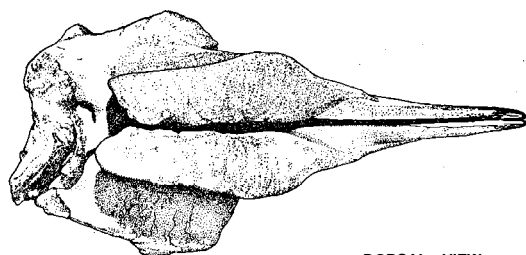


**Fig. 220 *Hyperoodon ampullatus***

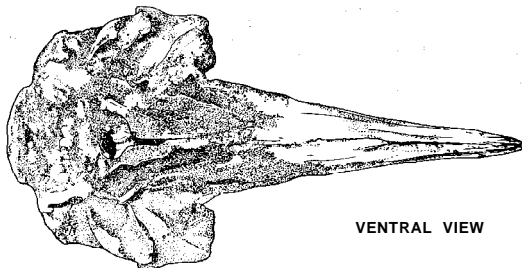
**Distinctive Characteristics:** Northern bottlenose whales are appropriately named; they have a long tube-like snout that is distinct from the melon. In young animals and females, the forehead slopes gently upward from the beak, but in adult males the forehead becomes very steep and bulging, with a squarish profile. A pair of forward-pointing grooves is found on the throat. The small dorsal fin is falcate and is located far back on the body. The flippers are small and blunt at the tips, and the flukes generally lack a median notch.

Calves are apparently either black or brownish in colour. There is some disagreement as to whether young animals are countershaded. Adults are dark greyish to chocolate brown above and somewhat lighter below. The brownish tinge is enhanced by a covering of diatoms. Some individuals are mottled with white to yellowish splotches and scars, which increase in number with age. Much of the melon and face may be light grey, or in adult males nearly white.

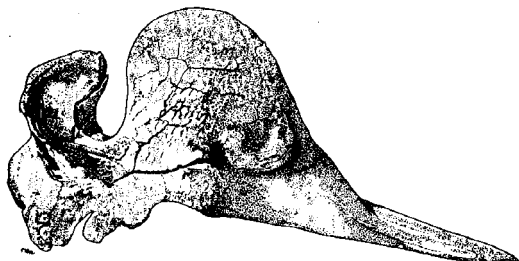
At the tip of the lower jaw are 2 conical teeth that erupt only in bulls, and are not visible outside the closed mouth. A second pair of teeth is sometimes buried in the gums behind the first, and 10 to 20 additional vestigial teeth may be found in the gums of both upper and lower jaws.



**DORSAL VIEW**



**VENTRAL VIEW**



**LATERAL VIEW**

**Fig. 221 Skull**

**Can be confused with:** Cuvier's beaked whales (p. 82) can be distinguished from bottlenose whales by differences in head shape and body colour. Species of the genus *Mesoplodon* (starting on p. 90) are distinguishable by their smaller size and more cone-shaped head.

**Size:** Adult females are up to 8.7 m and adult males up to 9.8 m in length. At birth calves are about 3.5 m.

**Geographical Distribution:** Northern bottlenose whales are found only in the North Atlantic, from New England to Baffin Island and southern Greenland in the west and from the Strait of Gibraltar to Svalbard in the east. These cold temperate to subarctic whales are found in deep waters, mostly seaward of the continental slope.

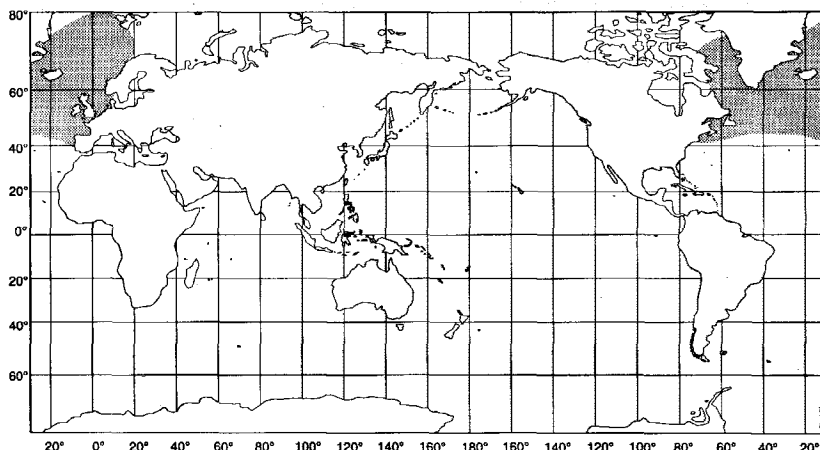


Fig. 222

**Biology and Behaviour:** Most pods contain at least 4 whales, sometimes with as many as 20, and there is some segregation by age and sex. These deep-divers can remain submerged an hour, possibly as long as 2. They are known for their habit of "standing by" injured companions, which permitted whalers to kill large numbers of whales at the same site. Bottlenose whales are also often curious and attracted to stationary vessels.

Northern bottlenose whales have a peak in calving in April.

Although primarily adapted to feeding on squid, these whales also eat fish, sea cucumbers, starfish, and prawns. They apparently do much of their feeding on or near the bottom.

**Exploitation:** Northern bottlenose whales have traditionally been the most heavily hunted of the beaked whales. Some hunting has been done by the British and Canadians, but by far the major bottlenose whaling nation was Norway. Early on, they were hunted primarily for oil, but later mainly for animal feed. No hunting has been conducted by Norway since 1973.

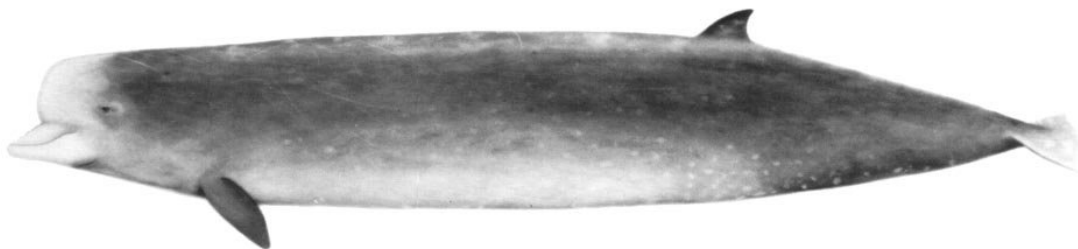
**IUCN Status:** Insufficiently known.

***Hyperoodon planifrons*** Flower, 1882

ZIPH Hyp 1

SRW

**FAO Names:** **En** - Southern bottlenose whale; **Fr** - Hyperoodon austral; **Sp** - Ballena nariz de botella del sur.



**Fig. 223 *Hyperoodon planifrons***

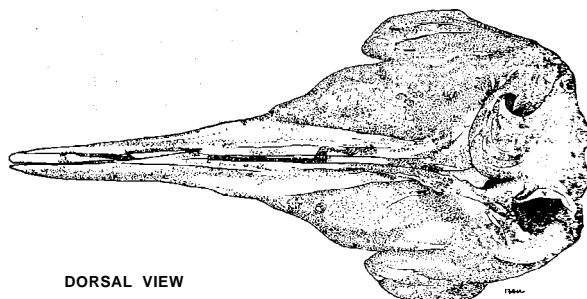
**Distinctive Characteristics:** This species resembles the northern bottlenose whale, with a bulbous melon (especially in adult males), tube-like beak, throat grooves, small dorsal fin, small blunt flippers, and flukes with no notch (or only a shallow one).

These animals are light brown to dull yellow. The belly and probably much of the head are lighter. Large animals can be covered with light splotches, scratches, and scars. The colour pattern of young calves is unknown.

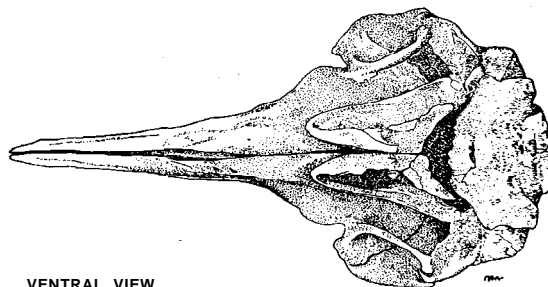
There is a single pair of conical teeth at the tip of the lower jaw, which erupts only in adult males, and is not visible outside the closed mouth. There may be a smaller second pair, and several sets of vestigial teeth, as well.

**Can be confused with:** Arnoux's beaked whales (p. 80) can be distinguished from southern bottlenose whales by differences in dorsal fin and head shape, and from Cuvier's beaked whales (p. 82) and Mesoplodon (starting on p. 90) primarily by head shape and body patterning.

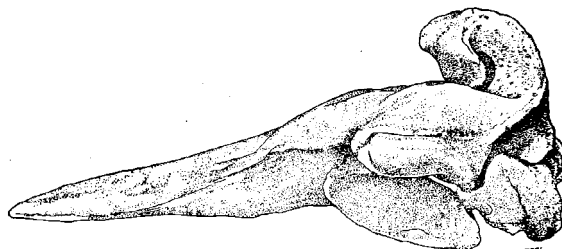
**Size:** Maximum known sizes are 7.8 m for females and about 7.2 m for males. If females are, in fact, larger than males, this species differs from its northern counterpart. However, the disparity is more likely a result of the small sample size of measured animals. Length at birth appears to be around 2 m.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

**Fig. 224 Skull**

**Geographical Distribution:** Southern bottlenose whales are thought to have a circumpolar distribution in the Southern Hemisphere, south of 29°S. They apparently migrate, and are found in Antarctic waters during the summer. Like other beaked whales, these are deep-water oceanic animals. It is possible that the whales in several sightings of bottlenose whales in the equatorial Pacific and Indian oceans were of this species (see below).

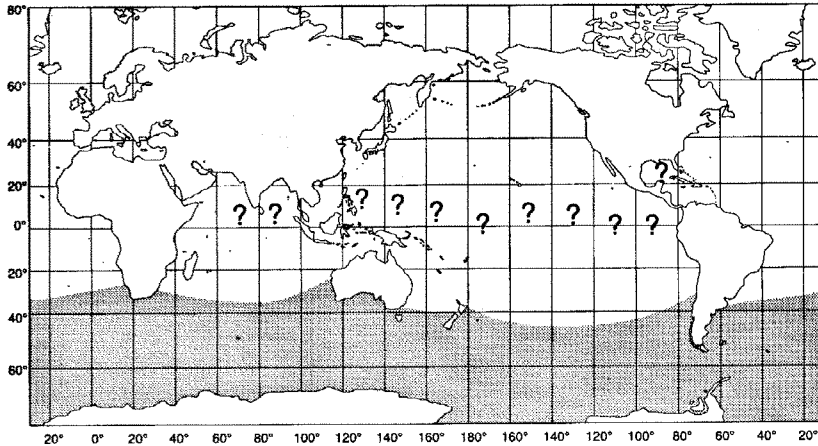


Fig. 225

**Biology and Behaviour:** Pods of less than 10 are most common, but groups of up to 25 have been seen. They are deep divers that can remain below for over an hour. There is essentially nothing known of the reproductive biology of this species. Southern bottlenose whales are thought to take primarily squid, but probably also eat fish and possibly squid.

**Exploitation:** Although never taken commercially, some southern bottlenose whales have been killed during whaling for research purposes. Recently, several of this species have been recorded as accidental victims of driftnet fishing in the Tasman Sea. Numbers taken annually are not known, however.

**IUCN Status:** Insufficiently known.

### ***Hyperoodon* sp. (unidentified)**

**Distinctive Characteristics:** There have been several sightings at widespread locations in the tropical Pacific and Indian oceans of an unidentified whale that appears to belong to the genus *Hyperoodon* (possibly the southern bottlenose whale, *H. planifrons*). These animals have steep bulbous foreheads and tube-like beaks. As in most other beaked whales, the dorsal fin is located behind the midpoint of the back, but it is larger than in other beaked whales. During these sightings, no teeth have been visible outside the closed mouth. Colour usually appears tan, but can range from umber-brown to bluish grey, generally with light areas on the sides and around the head. Some individuals have had scratches on the back. When seen, the blowhole was oriented with the concavity facing anteriorly; this is the opposite of the situation in Baird's beaked whale, the species with which it is most easily confused in the North Pacific.

**Size:** Size estimates have been in the range of 4 to 9 m.

**Geographical Distribution:** They are only rarely seen in the eastern tropical Pacific and there are a handful of sightings, as well as a single stranding possibly of this species, off Sri Lanka. Recently, there has been a report of what appears to be bottlenose whales in the Gulf of Mexico, as well.

**Biology and Behaviour:** It is thought that these animals may be southern bottlenose whales, which are normally widely distributed in the Southern Hemisphere, but so far no specimens have been collected to confirm this identification. It is also possible that these animals represent a third, as yet-unidentified, species of *Hyperoodon*. Herds of the unidentified whales have contained from 1 to 100 individuals, with many groups of 10 or greater (this is much larger than for Cuvier's beaked whale or the various *Mesoplodon* species).

***Tasmacetus shepherdii*** Oliver, 1937

ZIPH Tas 1

BSW

**FAO Names:** En - Shepherd's beaked whale; Fr - Tasmacete; Sp - Ballena picuda de Shepherd.

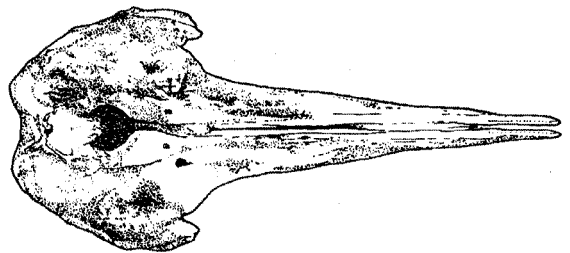


Fig. 226 *Tasmacetus shepherdii*

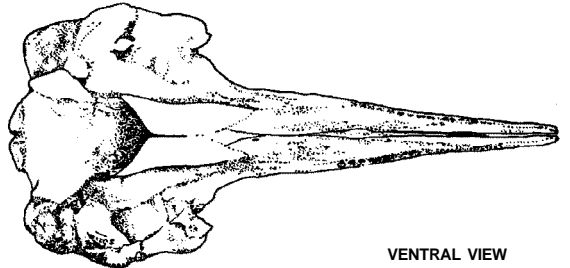
**Distinctive Characteristics:** Similar in body shape to the species of *Mesoplodon* described below, Shepherd's beaked whales have a long pointed beak, distinct from the relatively steep forehead. There is a shallow pair of throat creases. The flippers are small and rounded, and the dorsal fin, set far back, is short and falcate. Generally, the notch between the flukes (characteristic of most cetaceans) is absent.

Although all the descriptions are based on partially decomposed specimens, the colour pattern appears to be largely countershaded, dark grey above and lighter below. There are often several dark diagonal bands on the sides.

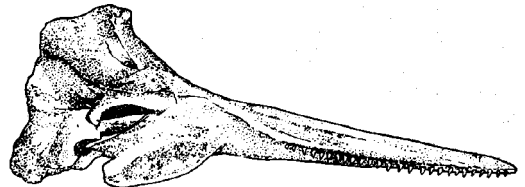
Unique to beaked whales, this species has a mouthful of sharp functional teeth. There are 17 to 21 per row in the upper jaw, and 17 to 29 in the lower. At the tip of the lower jaw is a pair of typical beaked whale tusks, which erupt only in adult males.



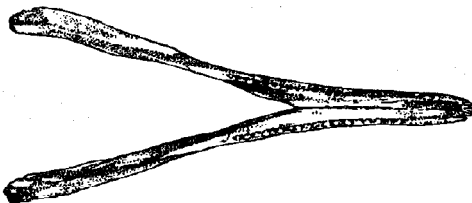
DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW



DORSAL VIEW OF MANDIBLE



Fig. 227 Skull

**Can be confused with:** Shepherd's beaked whales can be confused with other beaked whales, especially *Mesoplodon* (starting on p. 90). However, they appear to be somewhat larger than most species of *Mesoplodon*, and have a more steeply rising forehead.

**Size:** Lengths of 6.6 m (female) and 6.1 to 7 m (males) have been reported. Length at birth is unknown, but is presumed to be around 3 m.

**Geographical Distribution:** Shepherd's beaked whales are thought to have a circumpolar distribution in cold temperate waters of the Southern Hemisphere. There are records from New Zealand, southern and western Australia, both coasts of South America, and islands of the South Atlantic. Like other members of the family, these are probably exclusively oceanic, deep water animals.

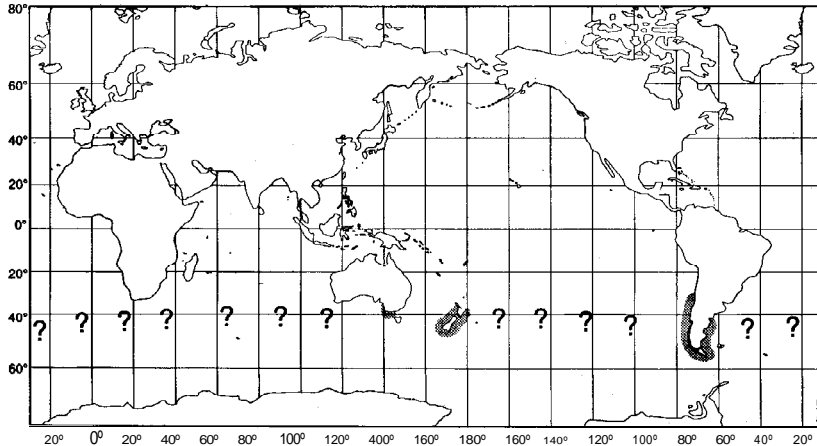


Fig. 228

**Biology and Behaviour:** Very little is known of the natural history of this species. All of the confirmed records are at least partially decomposed strandings. There are only 2 possible sighting records.

They are known to feed on several species of fish, possibly near the bottom in deep waters.

**Exploitation:** No records of human exploitation exist.

**IUCN Status:** Insufficiently known.

## Beaked Whales of the Genus *Mesoplodon*

The species of the genus *Mesoplodon* are very poorly known. Many of the species are known only, or primarily, from study of skeletal material or a few stranded carcasses. Because the external appearance and behaviour of individual species is poorly documented, it is nearly impossible, even for experts, to identify whales of the genus to species from sightings at sea. Even with a specimen in hand, museum preparation is often required for positive identification (except for adult males of some species). Useful field marks for adult males are beak length, shape of gape, location and size of teeth, and to a lesser extent, size and shape of the dorsal fin.

The distribution of most species is also poorly documented, and is mostly known from stranding records. More information is available from the eastern tropical Pacific than for any other area because of the extensive survey effort associated with the tuna fisheries there. Even for this area, however, the picture is very blurry. There are 14 species of *Mesoplodon* currently recognized. The newest of these was only described in 1991, and it is possible, even likely, that other undescribed species exist. Most species are similar in appearance, and only adult males are likely to be identifiable to species. Coloration is usually brownish grey to olive, often with extensive white spots and scarring, especially in adult males. The pattern of scarring (which is thought to be caused by intraspecific fighting among adult males) may be useful in narrowing identifications to one or several species. For example, sets of closely paired scratches suggest 2 teeth located near the tip of the beak (such as in True's or Hector's beaked whales), while single or more widely spaced parallel scratches may implicate species with more widely separated, protruding teeth set farther back in the jaws (Blainville's, strap-toothed, Stejneger's, Andrews', or Hubbs' beaked whales). Finally, Gervais', Sowerby's, Gray's, and ginkgo-toothed beaked whales have teeth that are removed from the tip of the jaw, but which do not project above the snout. Thus, these species would not be expected to have paired scars. All species of *Mesoplodon* have low, inconspicuous (usually invisible) blows and most have a small dorsal fin set about two-thirds of the way back from the snout tip.

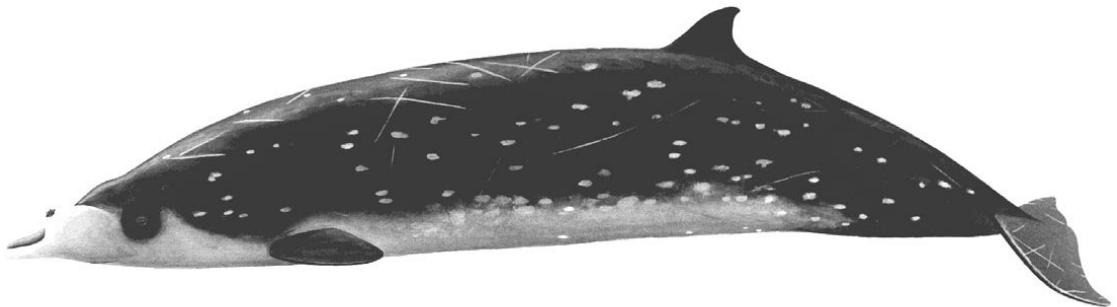
In general, mesoplodonts are slow and sluggish. Most sightings are brief, as these whales do not spend much time on the surface. They are presumed to pursue mostly squid at great depths. Groups are usually small, most often 7 or less. Almost nothing is known of their behaviour and social organization.

***Mesoplodon densirostris*** (de Blainville, 1817)

ZIPH Mes 1

BBW

**FAO Names:** En - Blainville's beaked whale; Fr - Baleine à bec de Blainville; Sp - Zifio de Blainville.



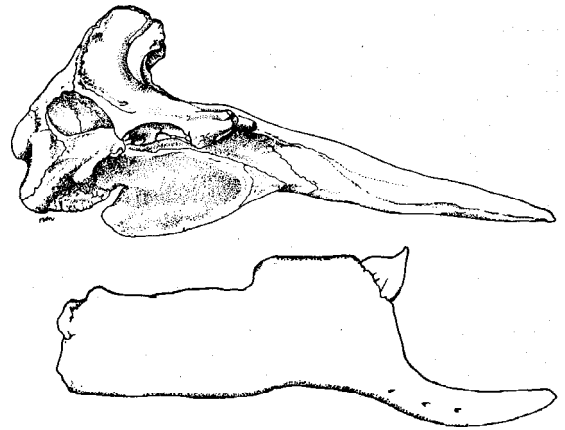
**Fig. 229 *Mesoplodon densirostris***

**Distinctive Characteristics:** Adult Blainville's beaked whales are blue-grey above and white below; coloration of young has not been properly described. The dark areas tend to have round or oval white scars and scratches.

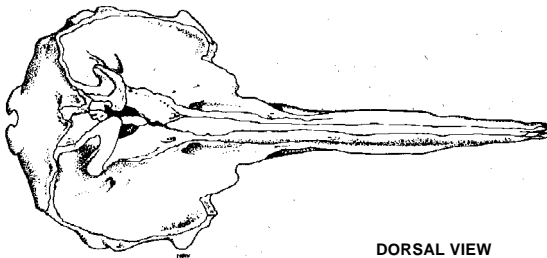
The lower jaw of this species is highly arched; a massive flattened tusk erupts from the top of this arch in adult males, and it extends above the top of the upper jaw. In some individuals the tusks are covered by a tassel of barnacles.

**Can be confused with:** Generally, only adult males of this species will be distinguishable from other species of *Mesoplodon* (starting on p. 90). The high arching mouthline and massive flattened tusks that extend above the upper jaw will allow identification of bulls,

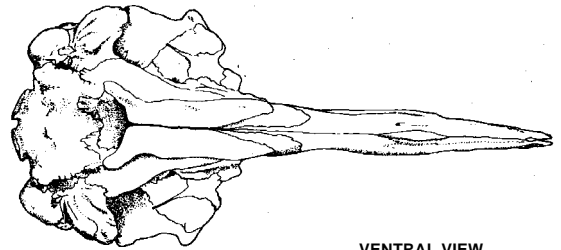
**Size:** Maximum size for both sexes appears to be around 4.7 m. Weights of up to 1 033 kg have been recorded. Length at birth is presumed to be between 2 and 2.5 m.



LATERAL VIEW



DORSAL VIEW



VENTRAL VIEW

Fig. 230 Skull

**Geographical Distribution:** Blainville's beaked whales occur in temperate and tropical waters of all oceans. Like other beaked whales, they are found mostly offshore in deep waters.

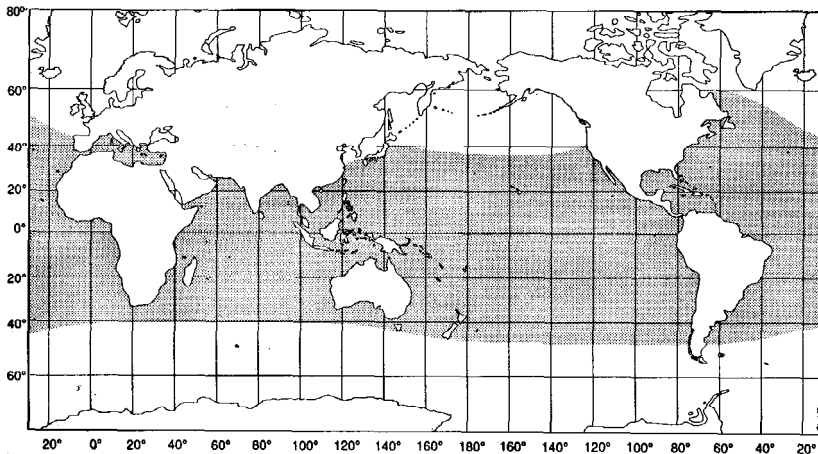


Fig. 231

**Biology and Behaviour:** Groups of 3 to 7 individuals have been recorded, although singles or pairs are most common. Dives of over 45 minutes have been recorded. Squid are probably the main food items, but some fish may be taken as well.

**Exploitation:** Some whales of this species have been taken in the North Pacific by Taiwanese whalers, and accidentally by Japanese tuna fishermen in the Indian Ocean.

**IUCN Status:** Insufficiently known.

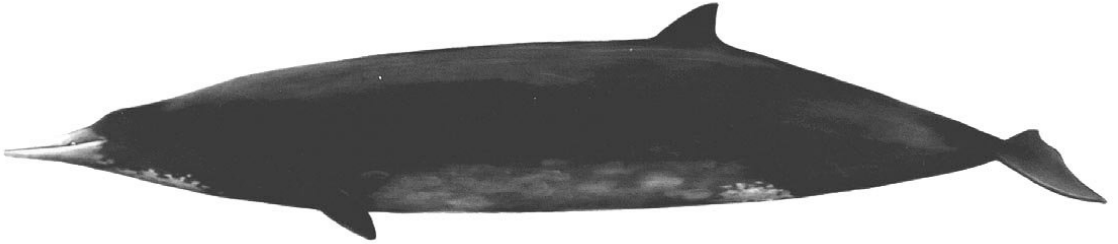


***Mesoplodon grayi*** von Haast, 1876

ZIPH Mes 2

BYW

**FAO Names:** En - Gray's beaked whale; Fr - Baleine à bec de Gray; Sp - Zifio de Gray.

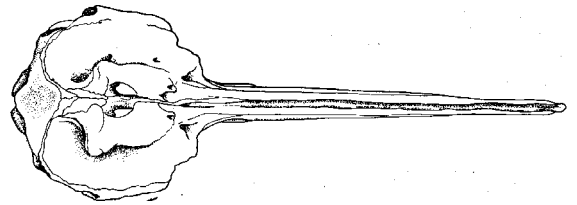


**Fig. 232 *Mesoplodon grayi***

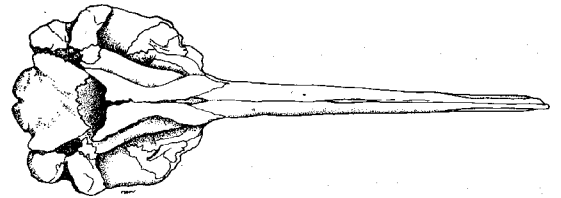
**Distinctive Characteristics:** Gray's beaked whales have small heads, with extremely long, narrow beaks.

Although mostly grey, white patches are found in the genital region and the beak becomes white in adults (Gray's beaked whales observed in the eastern tropical Pacific have had white lower jaws and dark upper jaws, separated by a straight mouthline).

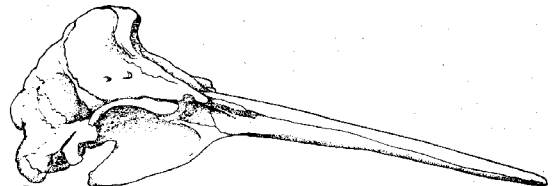
There are 2 small, triangular teeth set in the middle of the lower jaw, which erupt only in bulls, and 17 to 22 pairs of small teeth in the upper jaw.



**DORSAL VIEW**



**VENTRAL VIEW**



**LATERAL VIEW**

**Fig. 233 Skull**

**Can-be confused with:** The long white beak (often stuck up out of the water as the animal surfaces) and straight mouthline may allow Gray's beaked whales to be distinguished from other species of *Mesoplodon* (starting on p. 90), if a good look is obtained.

**Size:** Maximum known sizes are 5.6 m for both sexes. These animals are known to reach weights of at least 1 100 kg. Length at birth is probably between 2 and 2.5 m.

**Geographical Distribution:** This is primarily a Southern Hemisphere cool temperate species, which is possibly circum-antarctic in occurrence. There are many records from New Zealand and Australia, and others from South Africa, Argentina, Chile, and Peru. This species apparently wanders into the Northern Hemisphere on occasion, as evidenced by a few sightings in the eastern tropical Pacific and a stranding in the Netherlands.

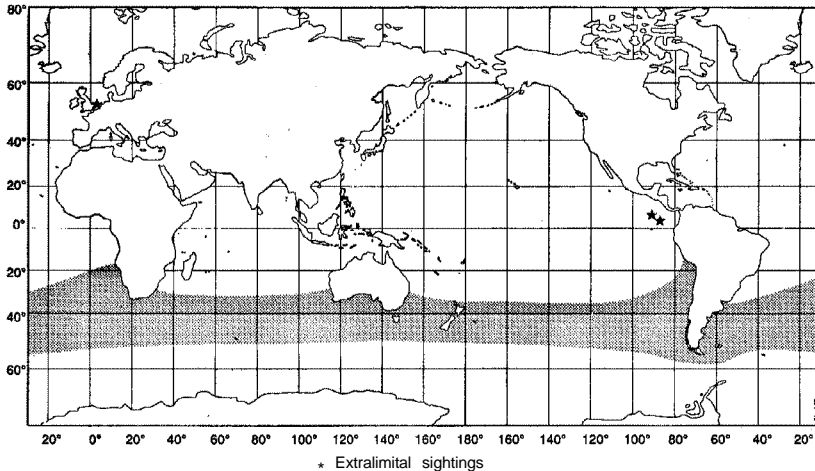


Fig. 234

**Biology and Behaviour:** Very little is known of the biology of this species. Gray's beaked whales are seen mostly as singles or pairs; however, there is one record of a mass stranding of 28 of these whales. Gray's beaked whales generally raise their long snouts out of the water when surfacing.

**Exploitation:** Unknown.

**IUCN Status:** Insufficiently known.

***Mesoplodon ginkgodens*** Nishiwaki and Kamiya, 1958

ZIPH Mes 3

TGW

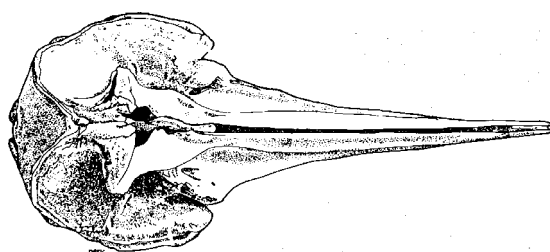
FAO Names: En - Ginkgo-toothed beaked whale; Fr - Baleine a bec de Nishiwaki; Sp - Zifio Japonés.



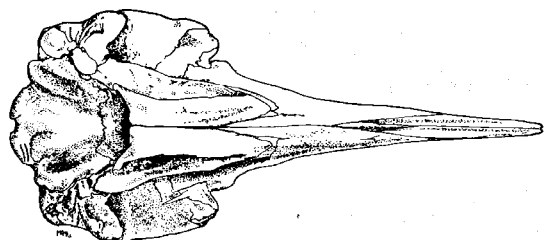
Fig. 235 *Mesoplodon ginkgodens*

**Distinctive Characteristics:** Adult male ginkgo-toothed beaked whales are dark grey, with light spots; females are apparently lighter. They do not appear to be as heavily scarred as most other mesoplodonts. The throat grooves, dorsal fin, and tail flukes are typical for *Mesoplodon* species.

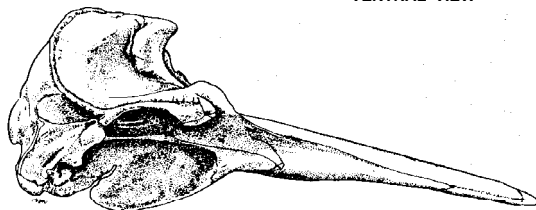
Bulls have flattened tusks that barely break the gumline, slightly behind the middle of the lower jaw; erupted teeth are absent in females.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 236 Skull

**Can be confused with:** The uniform dark pigmentation, small posteriorly placed teeth, and paucity of characteristic ziphiid scars may allow a tentative classification of adult male ginkgo-toothed beaked whales. Otherwise, this species will be virtually indistinguishable from other species of *Mesoplodon* (starting on p. 90).

**Size:** Maximum known sizes are 4.9 m (females) and 4.8 m (males). At birth, they are thought to be about 2 to 2.5 m.

**Geographical Distribution:** This species is known from widely scattered sightings, strandings, and collections (albeit sparse) in temperate and tropical waters of the Indo-Pacific Ocean.

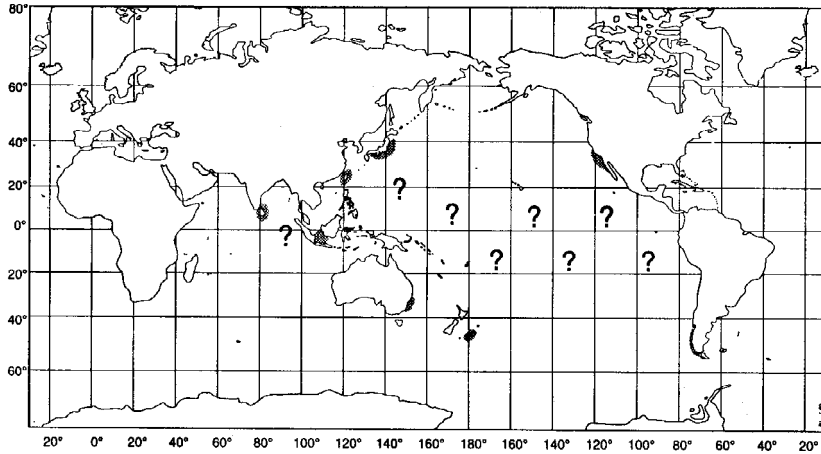


Fig. 237

**Biology and Behaviour:** Almost nothing is known of the biology of the ginkgo-toothed beaked whale.

**Exploitation:** A few animals have been taken in coastal fisheries off Japan.

**IUCN Status:** Insufficiently known.

***Mesoplodon hectori*** (Gray, 1871)

ZIPH Mes 4

BHW

**FAO Names:** En - Hector's beaked whale; Fr - Baleine à bec d' Hector; Sp - Zifio de Hector.

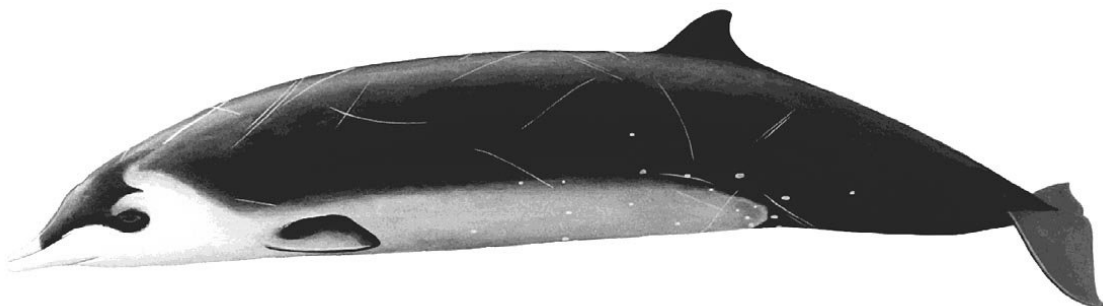
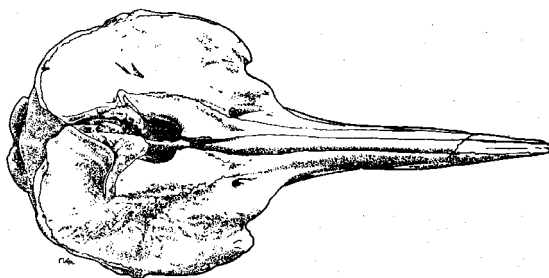


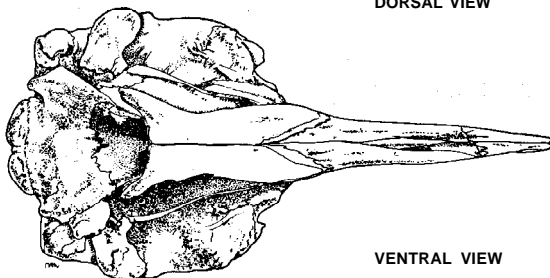
Fig. 238 *Mesoplodon hectori*

**Distinctive Characteristics:** Body colour of Hector's beaked whales appears to be dark grey-brown above and light grey below, with scratches often covering the body. Males have white on the undersides of the flukes.

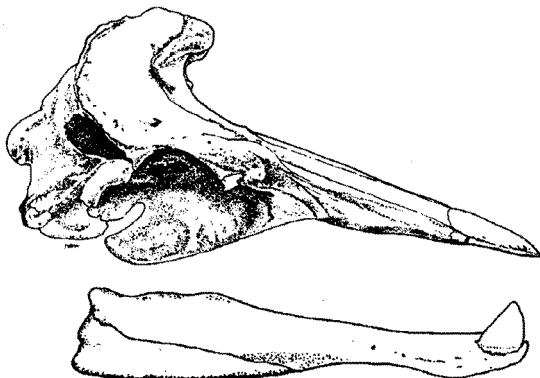
The single pair of flattened, triangular teeth is moderately small and is located near the tip of the lower jaw; they erupt only in bulls.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 239 Skull

**Can be confused with:** The placement of the flattened teeth of bulls at the tip of the lower jaw may allow them to be distinguished from other species of *Mesoplodon* (starting on p. 90) when the head is seen well.

**Size:** Females of up to 4.4 m and males of up to 4.3 m have been measured. Newborns presumably are about 2 to 2.5 m.

**Geographical Distribution:** Hector's beaked whale is primarily a Southern Hemisphere cool temperate species. The records are from southern South America, South Africa, Australia, and New Zealand. Recently, there have been several strandings and possible sightings off southern California, but it is unknown whether these represent extralimital strays or normal occurrences.

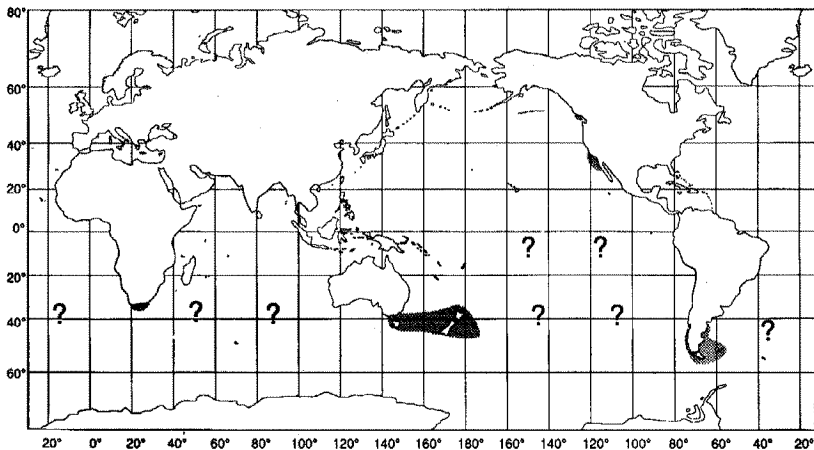


Fig. 240

**Biology and Behaviour:** Most of the few sightings have been of pairs of animals. Hector's beaked whales are known to feed on squid, and the remains of an unidentified invertebrate have been found in the stomach of an animal stranded in California.

**Exploitation:** This species is not known to have been commercially hunted; however, 1 individual was taken in the 1800s in New Zealand.

**IUCN Status:** Insufficiently known.

***Mesoplodon carlhubbsi*** Moore, 1963

ZIPH Mes 5

BUW

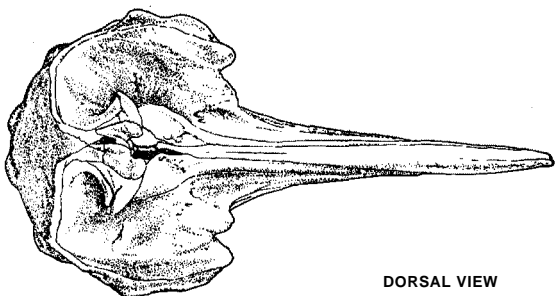
**FAO Names:** En - Hubbs' beaked whale; Fr - Baleine à bec de Hubbs; Sp - Zifio de Hubbs.



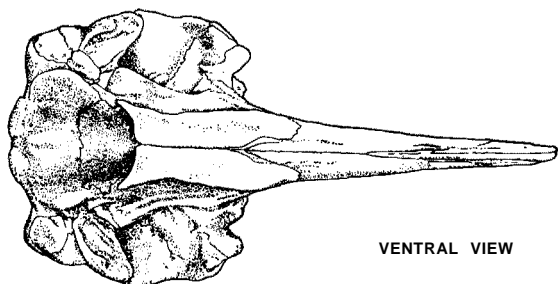
Fig. 241 *Mesoplodon carlhubbsi*

**Distinctive Characteristics:** Adult males of this species are more readily identifiable than individuals of most other species of *Mesoplodon*. They have a white rostrum and white "cap" in front of the blowhole. Females and young are much more difficult to identify.

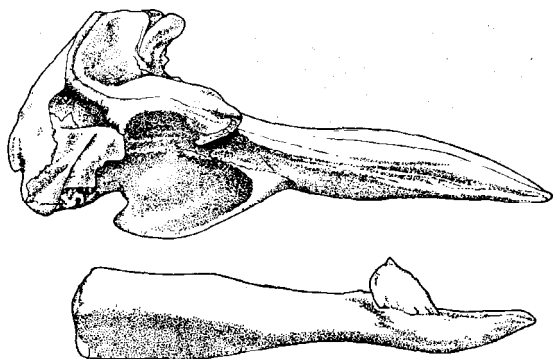
Males also have a massive flattened tusk in the middle of each side of the lower jaw, which protrudes above the level of the upper jaw.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 242 Skull

**Can be confused with:** The white cap and beak tip, and large tusks may allow bulls of this species to be distinguished from other species of *Mesoplodon* (starting on p. 90).

**Size:** Maximum known size is 5.3 m for both sexes. Weights of over 1 400 kg are attained. Newborns are about 2.5 m long.

**Geographical Distribution:** Apparently limited to the North Pacific, Hubbs' beaked whale is known from central British Columbia to southern California in the east, and from Japan in the west. It is an oceanic species.

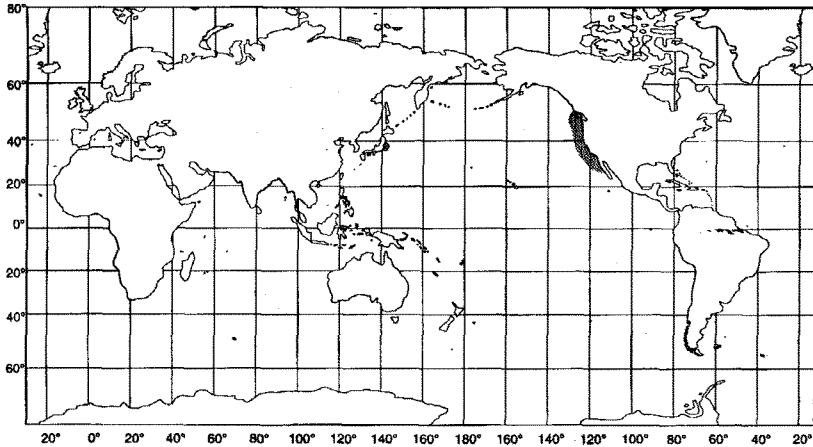


Fig. 243

**Biology and Behaviour:** Very little is known about the biology of this species. The long, white, parallel scratches on the bodies of males are thought to be caused by closed-mouth fighting in this and other species of *Mesoplodon*. Hubbs' beaked whales feed on squid and some deepwater fishes.

**Exploitation:** Some Hubbs' beaked whales have been taken by harpoon off Japan.

**IUCN Status:** Insufficiently known.



***Mesoplodon peruvianus*** Reyes, Mead, and Van Waerebeek, 1991

ZIPH Mes 6

BPW

FAO Names: En - Pygmy beaked whale; Fr - Baleine à bec pygmée; Sp - Ballena picuda.

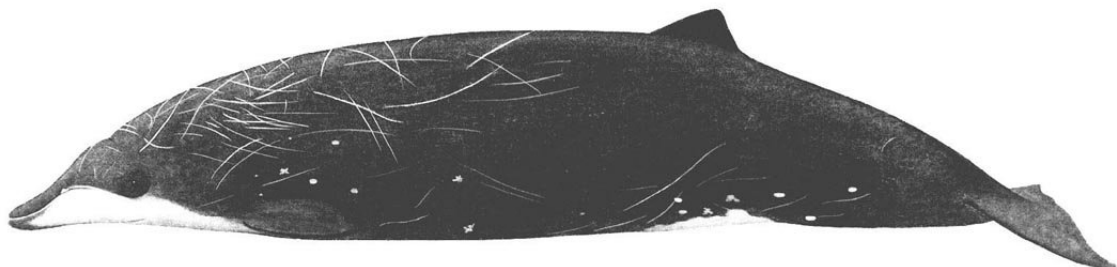
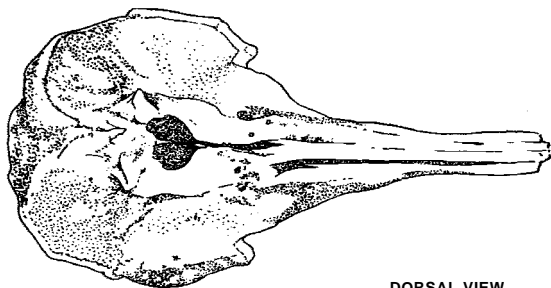


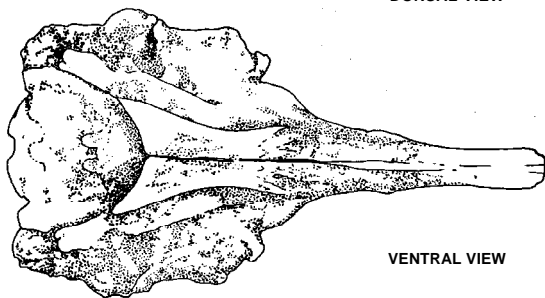
Fig. 244 *Mesoplodon peruvianus*

**Distinctive Characteristics:** The pygmy beaked whale is the most recently described member of the genus, and appears to be the smallest of the species of *Mesoplodon*. They tend to be dark grey above and lighter below, apparently with little scarring. They have small, triangular, wide-based dorsal fins that are shaped like those of harbour porpoises.

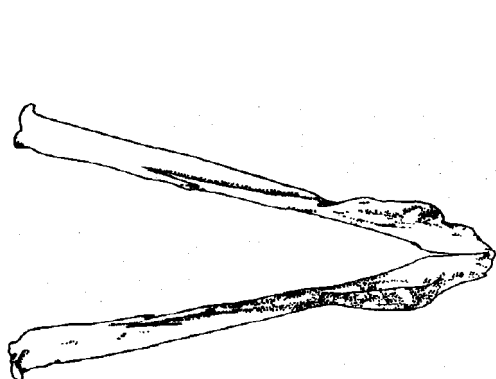
The most distinctive characteristic is the teeth, which are extremely small and egg-shaped in cross-section (although generally they are not visible in sightings at sea).



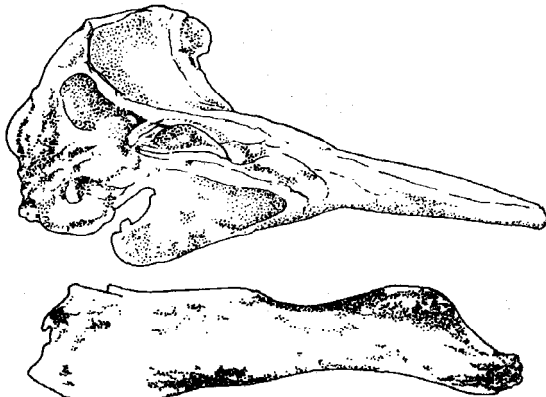
DORSAL VIEW



VENTRAL VIEW



DORSAL VIEW OF MANDIBLE



LATERAL VIEW

Fig. 245 Skull

**Can be confused with:** The small triangular dorsal fin is different from that of most other species of *Mesoplodon* (starting on p. 90), but using this character alone, it would be very difficult to dismiss the possibility of other species in sightings at sea.

**Size:** This is the smallest known species of *Mesoplodon*; maximum known length is 3.7 m, apparently with males larger than females. At birth, these animals are about 1.6 m long.

**Geographical Distribution:** The pygmy beaked whale is known only from 10 specimens and a few possible sightings off Peru, all south of 8°S and in the eastern tropical Pacific. Recently, there have been 2 strandings of pygmy beaked whales near La Paz, Baja California, Mexico.

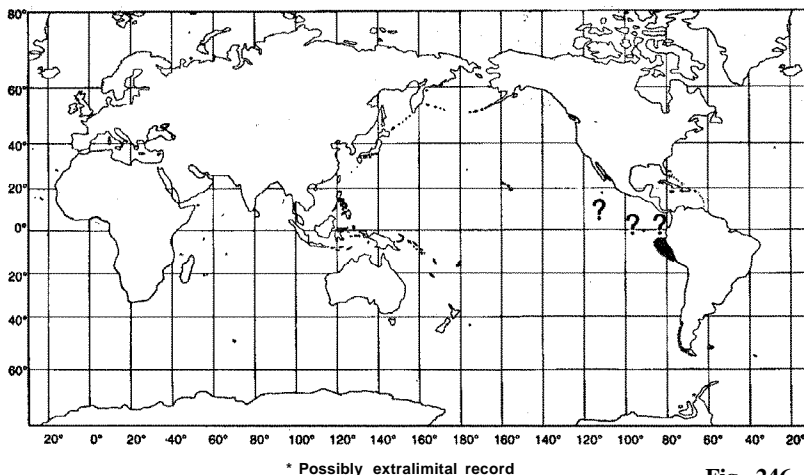


Fig. 246

**Biology and Behaviour:** The diet consists of small mid-water fishes, oceanic squid, and shrimps. Groups of 2 or 3 animals have been observed.

**Exploitation:** Pygmy beaked whales are taken in the driftnet fishery for sharks off the coast of Peru.

**IUCN Status:** Insufficiently known.

***Mesoplodon bidens*** (Sowerby, 1804)

ZIPH Mes 7

BWW

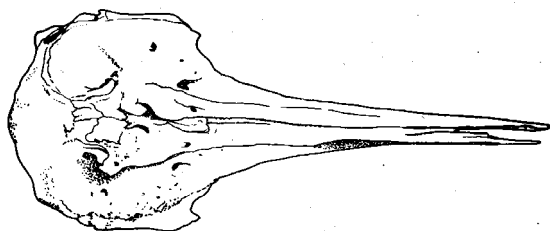
**FAO Names:** En - Sowerby's beaked whale; Fr - Baleine à bec de Sowerby; Sp - Zifio de Sowerby.



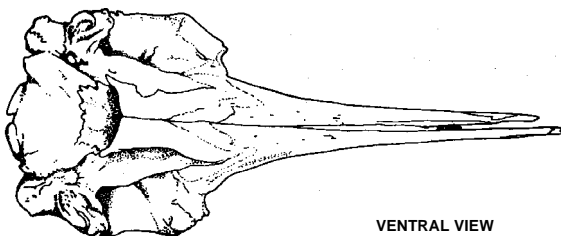
Fig. 247 *Mesoplodon bidens*

**Distinctive Characteristics:** Sowerby's beaked whales have the typical *Mesoplodon* body shape, but tend to have a very long (for *Mesoplodon*) beak and a bulge on the forehead. The 2 teeth of adult males erupt from the middle of the lower jaw, and are visible outside the closed mouth, although they are not particularly large.

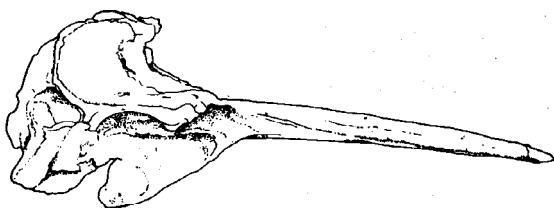
Coloration is not well known, but generally appears charcoal grey, with a lighter belly. White or light grey spots are common on the body of adults; however, young animals have less spotting.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 248 Skull

**Can be confused with:** Sowerby's beaked whales might be confused with other species of *Mesoplodon* (starting on p. 90) and even bulls would be nearly impossible to distinguish at sea from related species. The limited distribution will help narrow the choices,

**Size:** Males reach lengths of at least 5.5 m and females, 5.1 m. Newborns average 2.4 m.

**Geographical Distribution:** These beaked whales are known only from the colder waters of the North Atlantic, from at least Massachusetts to Labrador in the west, and from Iceland to Norway in the east. The range is known to include the Baltic Sea, but not the Mediterranean. The North Sea appears to be the centre of abundance. There is a single record from the Gulf of Mexico, but this may represent an extralimital occurrence.

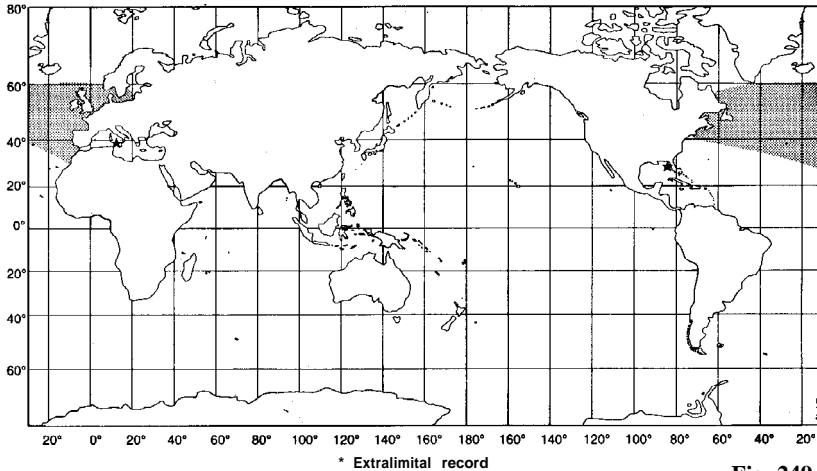


Fig. 249

**Biology and Behaviour:** Almost nothing is known of the natural history of this species beyond what has been learned from strandings, which have involved singles and pairs. Sowerby's beaked whales feed on squid and small fish. The breeding season appears to be late winter to spring.

**Exploitation:** Some are known to have been taken in Newfoundland in a small-scale fishery.

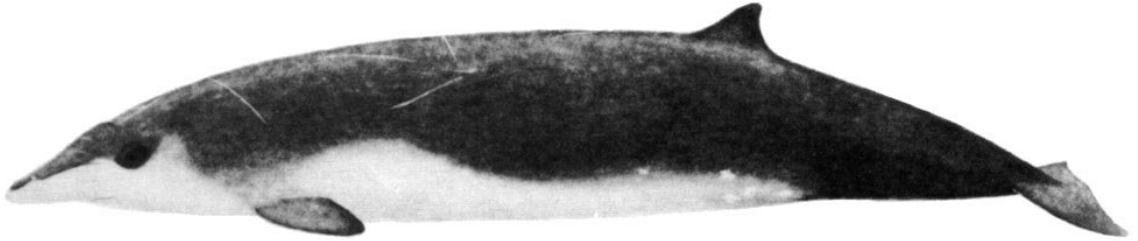
**IUCN Status:** Insufficiently known.

***Mesoplodon europaeus*** Gervais, 1855

ZIPH Mes 8

BGW

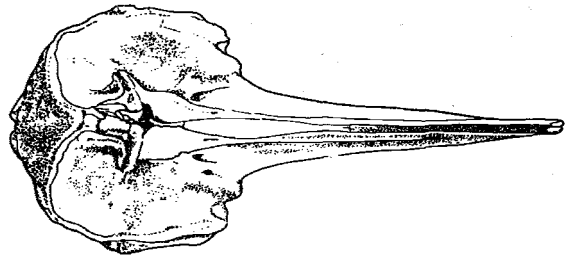
**FAO Names:** En - Gervais' beaked whale; Fr - Baleine à bec de Gervais; Sp - Zifio de Gervais.



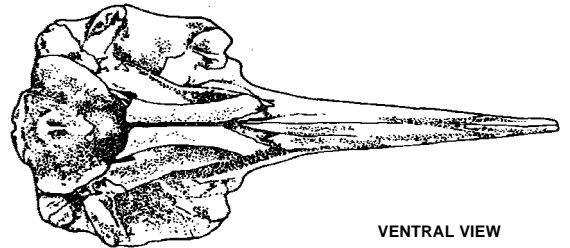
**Fig. 250 *Mesoplodon europaeus***

**Distinctive Characteristics:** Gervais' beaked whales are dark grey above and lighter grey below. In young animals, the belly is white.

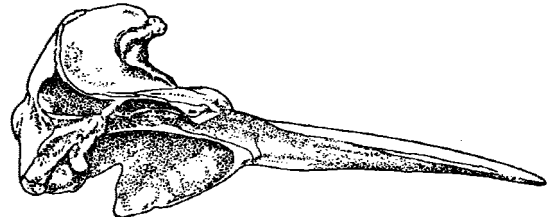
The teeth of adult males are found one-third of the distance from the snout tip to the gape. They are visible outside the closed mouth. The mouthline is relatively straight.



DORSAL VIEW



VENTRAL VIEW



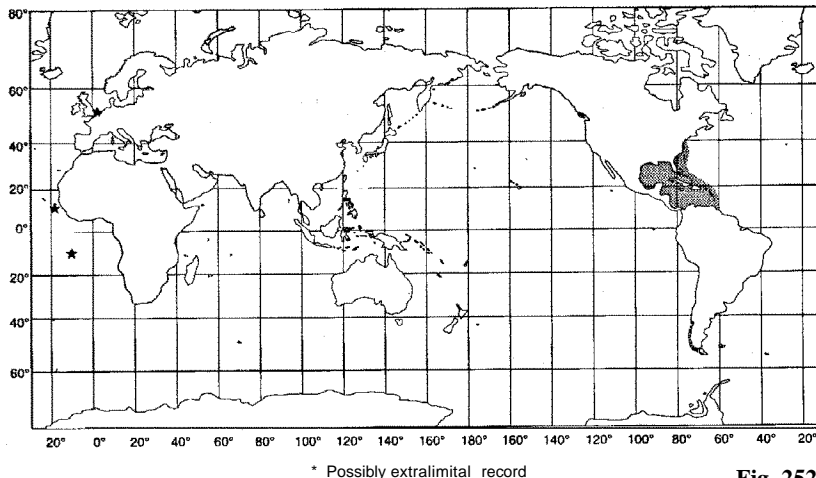
LATERAL VIEW

**Fig. 251 Skull**

**Can be confused with:** Gervais' beaked whales are nearly impossible to distinguish at sea from other species of *Mesoplodon* (starting on p. 90).

**Size:** Males attain lengths of at least 4.5 m, and adult females reach at least 5.2 m. Weights of at least 1 200 kg are attained. Newborns are about 2.1 m in length.

**Geographical Distribution:** Most records are from the east and Gulf coasts of North America, from New York to Texas, but Gervais' beaked whales are also known from several of the Caribbean islands. In the eastern Atlantic, they are known from the English Channel to Guinea-Bissau in West Africa. There is also a stranding at Ascension Island, in the central South Atlantic.



**Fig. 252**

**Biology and Behaviour:** The favoured habitat of Gervais' beaked whales appears to be warm temperate and tropical waters. Like other members of the genus, they are known to feed on squid.

**Exploitation:** There is a record of 1 being taken in a net off New Jersey, and others may have been taken in Caribbean small cetacean fisheries.

**IUCN Status:** Insufficiently known.

***Mesoplodon mirus*** True, 1913

ZIPH Mes 9

BTW

**FAO Names:** True's beaked whale: **Fr** - Baleine à bec de True; **Sp** - Zifio de True.

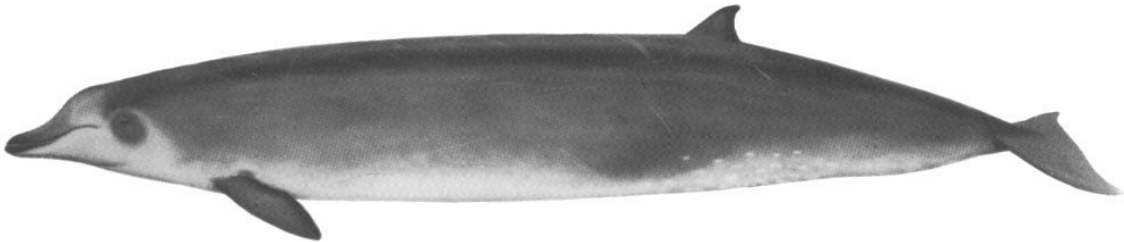


Fig. 253 *Mesoplodon mirus*

**Distinctive Characteristics:** True's beaked whales are not known to differ substantially from other species of *Mesoplodon*, although they have a slightly bulging forehead and prominent beak.

These beaked whales are characterized by the position of the mandibular teeth at the very tip of the lower jaw. The teeth are oval in cross-section, lean forward, and are visible outside the closed mouth of adult males.

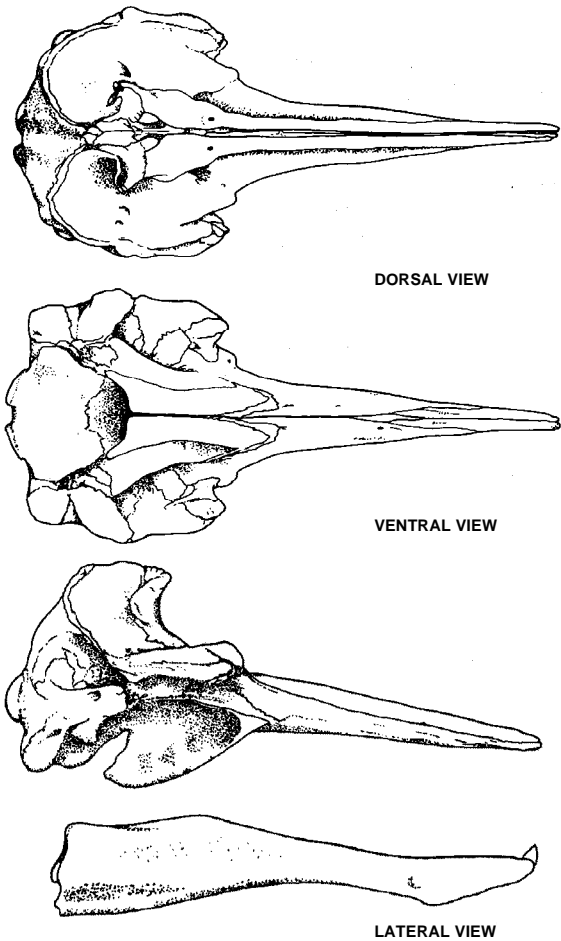


Fig. 254 Skull

**Can be confused with:** At sea, True's beaked whales are difficult to distinguish from other species of *Mesoplodon* (starting on p. 90). The only other species in which males have oval teeth at the tip of the lower jaw is Longman's beaked whale (p. 112); whose appearance is not known.

**Size:** Both sexes are known to reach lengths of slightly over 5 m. Weights of up to 1 400 kg have been recorded. Newborns are probably between 2 and 2.5 m.

**Geographical Distribution:** True's beaked whales are known only from strandings in Great Britain, from Florida to Nova Scotia in the North Atlantic, and from southeast Africa and southern Australia in the Indo-Pacific Ocean.

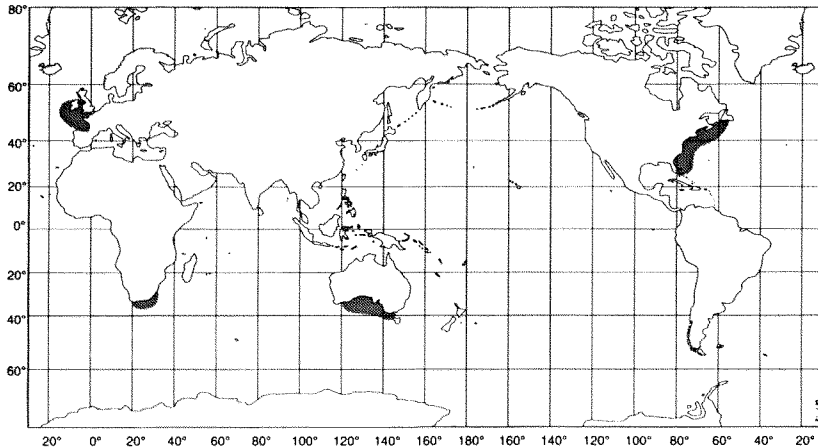


Fig. 255

**Biology and Behaviour:** There is almost no information available on the natural history of this species of beaked whale. Stranded animals have had squid in their stomachs.

**Exploitation:** An individual of this species was taken off Nova Scotia in 1938, but no other exploitation is known.

**IUCN Status:** Insufficiently known.



***Mesoplodon layardii*** (Gray, 1865)

ZIPH Mes 10

TSW

**FAO Names:** En - Strap-toothed whale; Fr - Baleine à bec de Layard; Sp - Zifio de Layard.

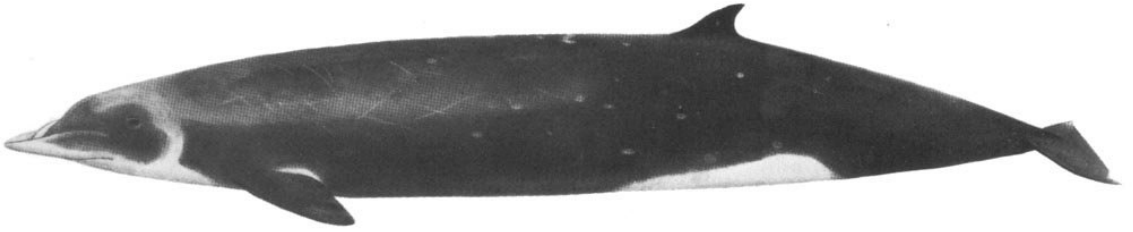
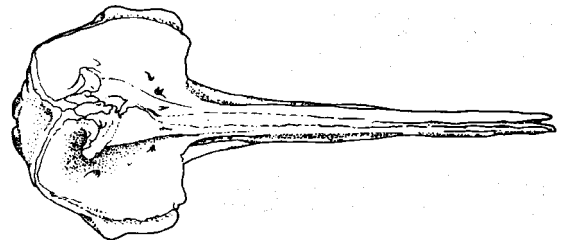


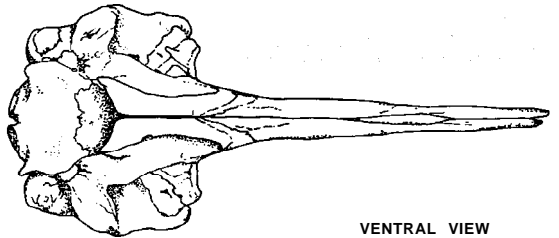
Fig. 256 *Mesoplodon layardii*

**Distinctive Characteristics:** Although the body shape of this whale is rather undistinctive, the teeth of adult males are unique. The long tusks emerge from near the middle of the lower jaw and curl backward and inward, extending over the upper jaw, often preventing it from opening more than a few centimetres. How the animals eat with such an arrangement is unknown.

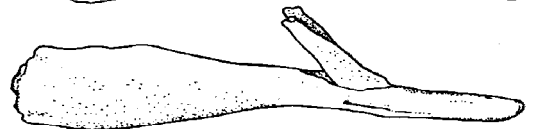
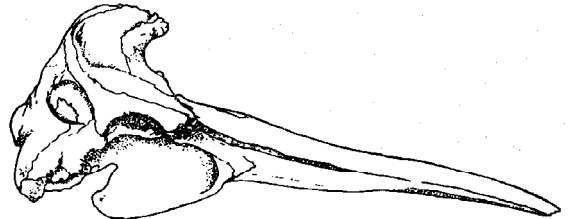
The complex-colour pattern is better-known than that of most species of *Mesoplodon*, as this species is known from more specimens than any other in the genus. The body is mostly grey or black, sometimes with a purple or brown tinge. Much of the underside is white: around the urogenital opening, between the flippers, on the beak, and in a band of variable width around the head. Variable white or light grey patches tend to be found on the back and sides.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 257 Skull

**Can be confused with:** The unique tusks of adult males of this species will make them identifiable, if seen. Females and subadults will likely be impossible to distinguish from other *Mesoplodon* species (starting on p. 90).

**Size:** Adult females reach lengths of at least 6.2 m and males reach 5.9 m, making this the largest species of *Mesoplodon*. Length at birth is unknown, but is probably close to 3 m.

**Geographical Distribution:** Strap-toothed whales may have a continuous distribution in cold temperate waters of the Southern Hemisphere: there have been strandings in South Africa, Australia, Tasmania, New Zealand, Tierra del Fuego, Uruguay, and the Falkland Islands.

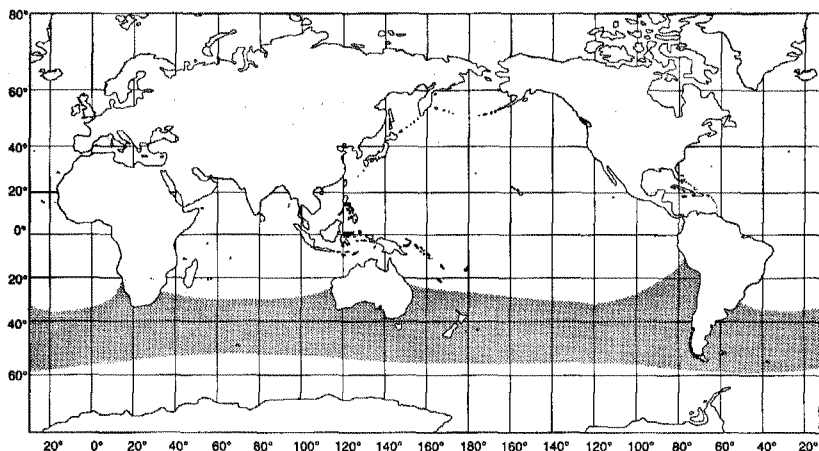


Fig. 258

**Biology and Behaviour:** Groups of up to 3 individuals have been seen. These animals are difficult to approach. Strap-toothed whales are commonly stranded, but little has been learned from the few sightings of live animals. They eat squid, and the single stomach examined also contained a piece of algae. Calving appears to occur in spring to summer.

**Exploitation:** No exploitation of this species has been reported.

**IUCN Status:** Insufficiently known.

**Mesoplodon bowdoini** Andrews, 1908

ZIPH Mes 11

BDW

**FAO Names:** En - Andrews' beaked whale; Fr - Baleine à bec de Bowdoin; Sp - Zifio de Andrews.

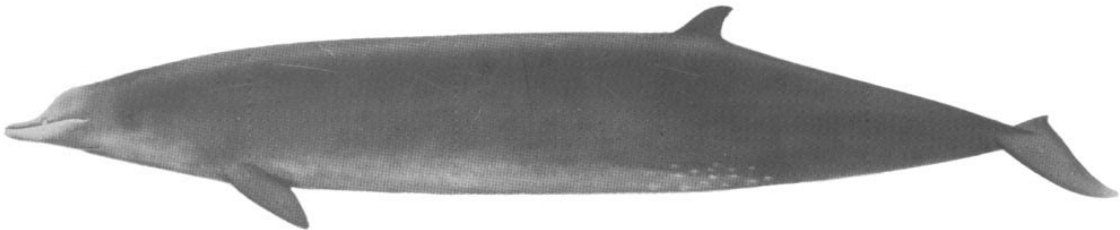


Fig. 259 *Mesoplodon bowdoini*

**Distinctive Characteristics:** The external appearance of Andrews' beaked whale is poorly known; however, its skeleton is similar to that of Hubbs' beaked whale. Adult males are all dark, except for the front half of the beak, which is white. The flattened tusks of males of this species emerge from the middle of the lower jaw on raised sockets, and protrude above the upper jaw.

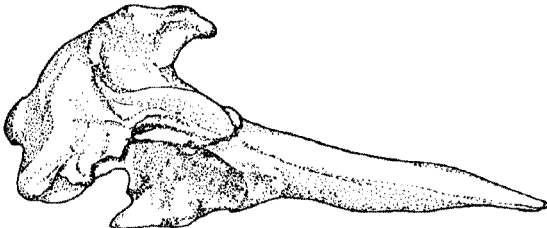
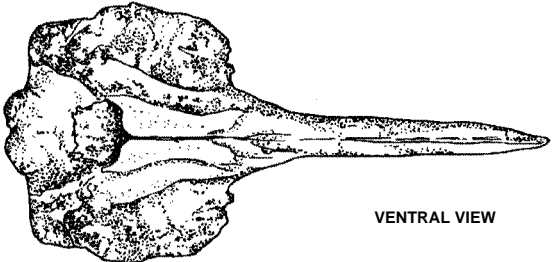
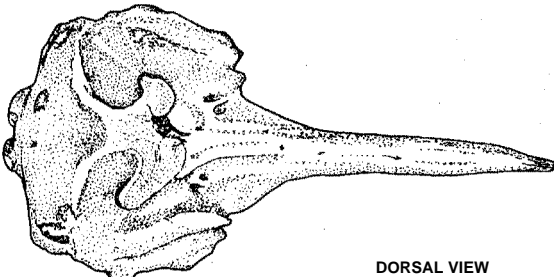


Fig. 260 Skull

**Can be confused with:** The teeth of bulls, if seen well, will allow Andrews' beaked whale to be distinguished from most other *Mesoplodon* species (starting on p. 90). They are most likely to be mistaken for Blainville's beaked whale (p. 90) but lack the arched lower jaw.

**Size:** Females reach at least 4.6 m in length and males reach 4.7 m. Length at birth is presumed to be about 2 m.

**Geographical Distribution:** To date, Andrews' beaked whale is known only from the South Pacific and Indian oceans. Strandings have occurred in Australia, New Zealand, Tasmania, and the Kerguelen Islands.

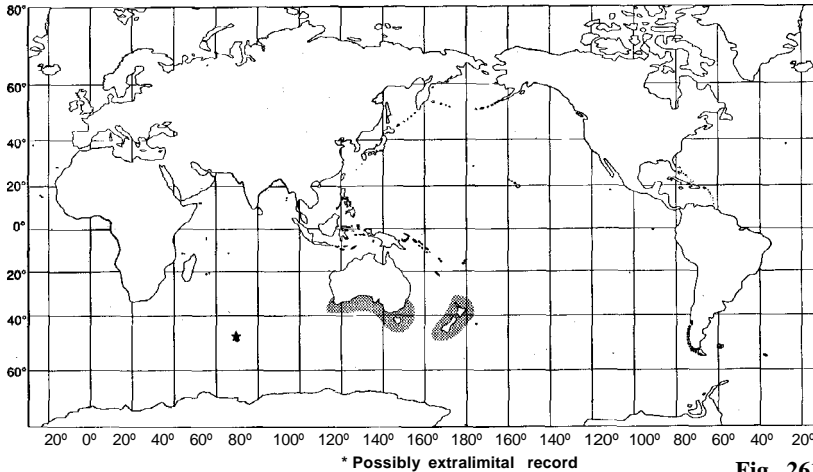


Fig. 261

**Biology and Behaviour:** Essentially nothing is known of the biology of this species, other than the few facts that have been gleaned from stranded individuals.

**Exploitation:** No exploitation of this species is known.

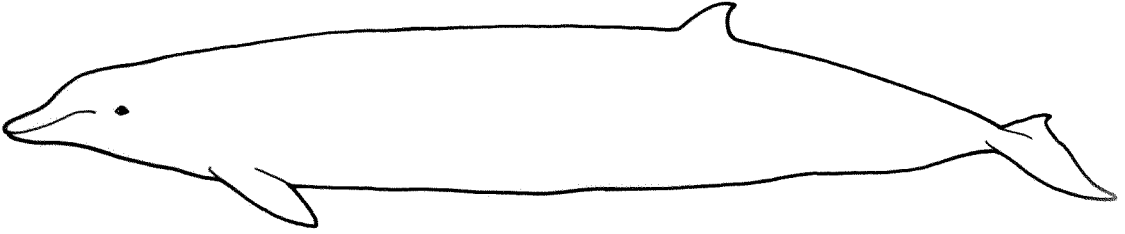
**IUCN Status:** Insufficiently known.

***Mesoplodon pacificus*** Longman, 1926

ZIPH Mes 12

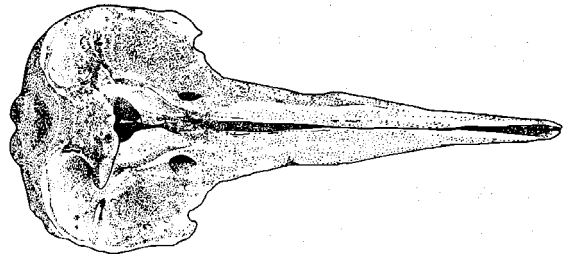
BNW

**FAO Names:** En - Longman's beaked whale; Fr - Baleine à bec de Longman; Sp - Zifio de Longman.

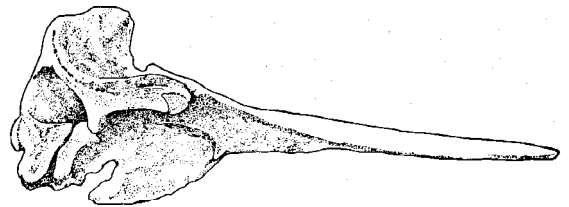


**Fig. 262 *Mesoplodon pacificus*** (body shape and coloration are unknown for this species)

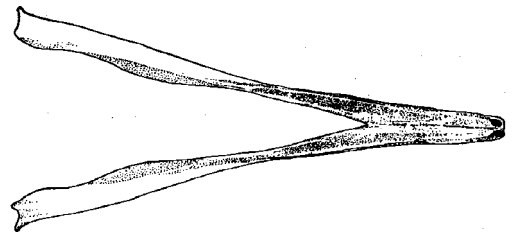
**Distinctive Characteristics:** Nothing is known of the external appearance of Longman's beaked whale, as it is known only from 2 damaged skulls. The teeth of adult males are oval in cross-section, are located at the tip of the lower jaw, and point forward.



DORSAL VIEW



LATERAL VIEW



DORSAL VIEW OF MANDIBLE

**Fig. 263 Skull**

**Can be confused with:** Until a fresh carcass is examined, Longman's beaked whales cannot be positively identified (except from examination of the skull). In shape and position, the teeth most closely resemble those of True's beaked whales (p. 106).

**Size:** The size of Longman's beaked whale is unknown, but based on the size of a skull it is thought to reach lengths of over 6 m.

**Geographical Distribution:** The distribution of Longman's beaked whale is incompletely known, but it may be limited to the Indo-Pacific region. The 2 available skulls are from Australia and Somalia.

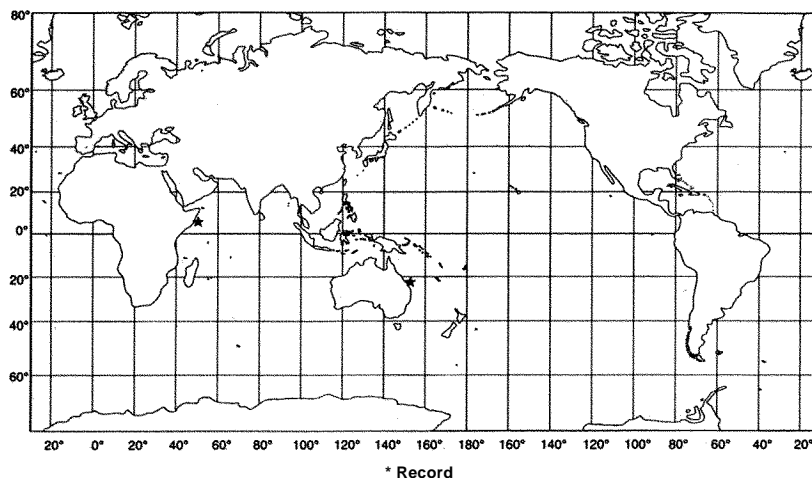


Fig. 264

**Biology and Behaviour:** Although Longman's beaked whale is here classified in the genus *Mesoplodon*, some researchers believe it belongs in its own genus, *Indopacetus*. It qualifies as the most poorly known of all the marine mammals.

**Exploitation:** There is no known exploitation of this species.

**IUCN Status:** Insufficiently known.

***Mesoplodon stejnegeri*** True, 1885

ZIPH Mes 13

BTW

FAO Names: En - Stejneger's beaked whale; Fr - Baleine à bec de Stejneger; Sp - Zifio de Stejneger.

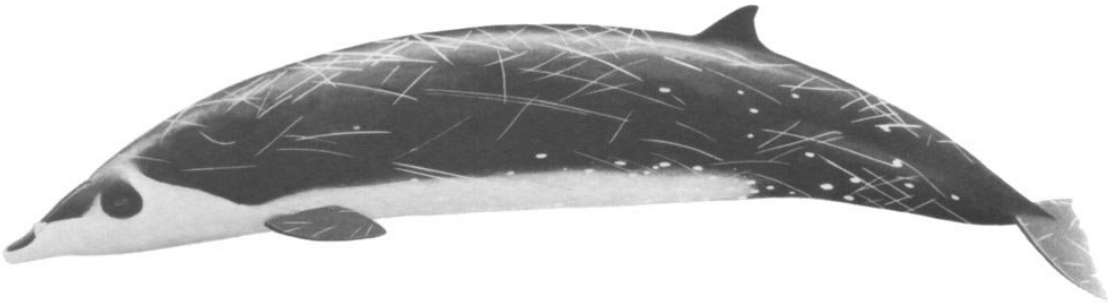
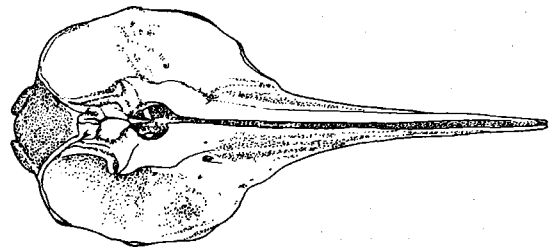


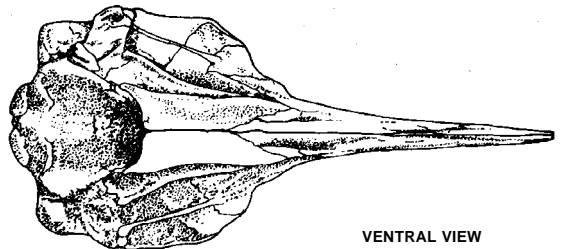
Fig. 265 *Mesoplodon stejnegeri*

**Distinctive Characteristics:** Stejneger's beaked whale has the characteristic *Mesoplodon* body shape. Apparently, both sexes are uniformly grey to black, often with extensive scarring in bulls.

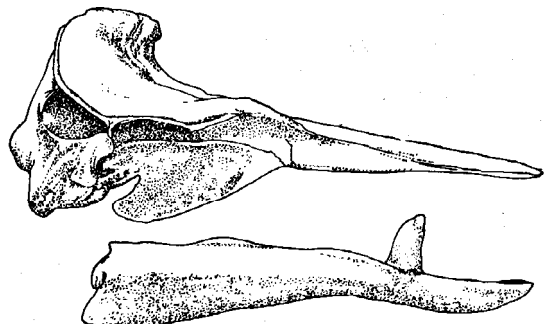
The flattened tusks of males are situated near the middle of the lower jaw, and point forward. They are located on raised prominences, so that the crowns extend above the rostrum.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 266 Skull

**Can be confused with:** Adult males will be distinguishable from most other *Mesoplodon* species (starting on p. 90) by tooth shape and position. Within Stejneger's beaked whale's range, both Hubbs' (p. 98) and Blainville's (p. 90) beaked whale males have similar teeth.

**Size:** Both sexes reach lengths of at least 5.3 m. Newborns are assumed to be between 2 and 2.5 m in length.

**Geographical Distribution:** Stejneger's beaked whales are found in continental slope and oceanic waters of the North Pacific Basin, from southern California, north to the Bering Sea, and south to the Sea of Japan. This appears to be primarily a cold temperate and subarctic species. It is most commonly stranded in Alaska, especially along the Aleutian Islands.

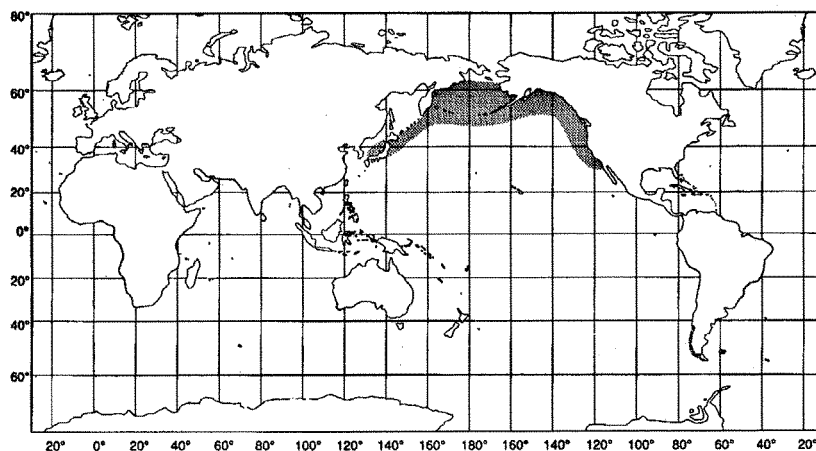


Fig. 267

**Biology and Behaviour:** Groups of 5 to 15 individuals have been observed, often containing animals of mixed sizes. Stejneger's beaked whales are known to feed on squid.

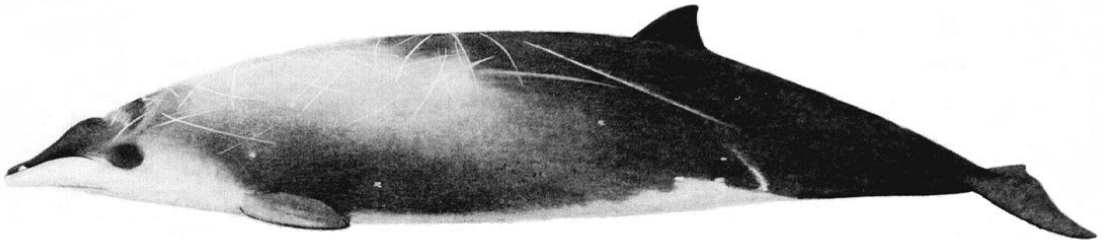
**Exploitation:** Several Stejneger's beaked whales are known to have been taken in salmon driftnets off Japan, and there have probably been occasional direct catches of this species off Japan and possibly elsewhere.

**IUCN Status:** Insufficiently known.



***Mesoplodon* sp. (unidentified)**

FAO Names: En - *Mesoplodon* species "A."



**Fig. 268 *Mesoplodon* sp. (unidentified)**

**Distinctive Characteristics:** An unidentified whale of the genus, referred to as *Mesoplodon* species 'A,' has been described from the eastern tropical Pacific, based on many sightings at sea. Two morphs exist, a scarred black and white form that is easily identified in the field (presumably adult males), and a smaller uniformly brown one (probably females and subadults). These animals have moderately long beaks, and low triangular dorsal fins with slightly falcate or straight trailing edges. They do not match with descriptions of any known whale, and may represent an undescribed species.

**Can be confused with:** Adult males may be distinguishable by the presence of a broad swathe that runs from the head and down the sides, on the otherwise black body. Females and immatures are not readily distinguishable from other species of *Mesoplodon* (starting on p. 90).

**Size:** Maximum length estimates for these animals are about 5.5 m.

**Geographical Distribution:** *Mesoplodon* species "A" is the most frequently sighted *Mesoplodon* whale in the offshore eastern tropical Pacific, and may be endemic to these waters.

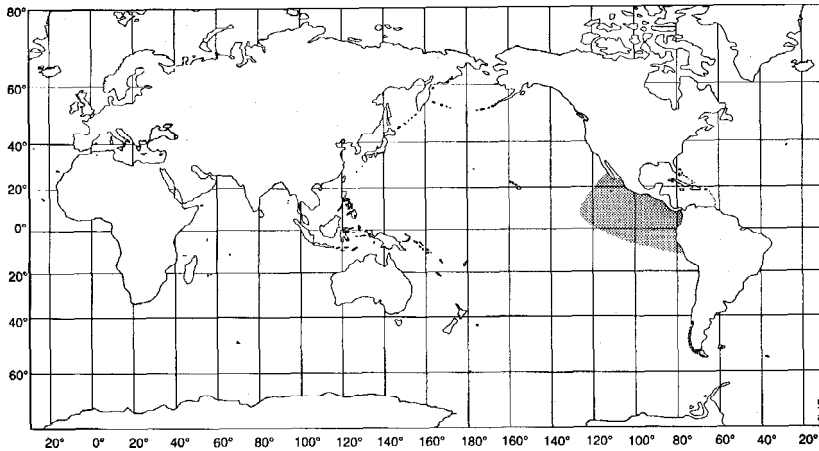


Fig. 269

**Biology and Behaviour:** Most groups have been of 2 animals, but have ranged up to 4. The behaviour of these animals appears to be similar to that of other species of mesplodonts, but during a sighting of a single male in the eastern tropical Pacific, the animal breached 3 times.

**Exploitation:** This animal is known only from sightings at sea, and no human exploitation is known.

**IUCN Status:** Not listed.

***Orcaella brevirostris*** (Gray, 1866)

DELPH Orcae 1

IRD

**FAO Names:** En - Irrawaddy dolphin; Fr - Orcelle; Sp - Delfín del Irawaddy.

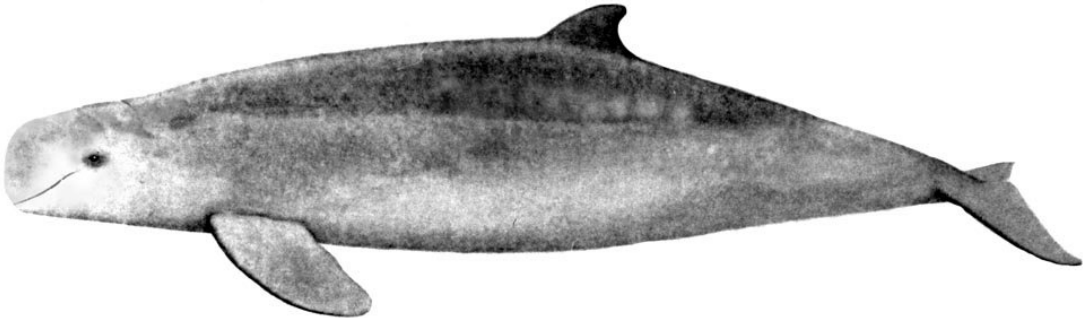
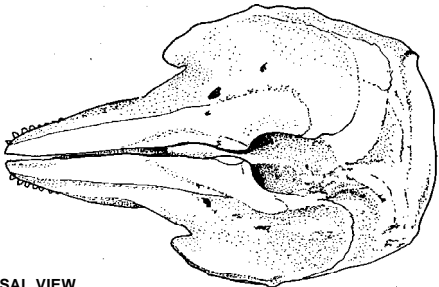


Fig. 270 *Orcaella brevirostris*

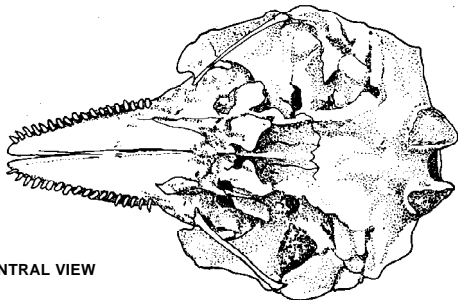
**Distinctive Characteristics:** The Irrawaddy dolphin resembles the finless porpoise, but unlike that species, it has dorsal fin. The fin is small and triangular, with a bluntly rounded tip, and is set just behind midback. The large flippers have curved leading edges and rounded tips. The head is blunt, with no beak; the mouthline is straight, and there may be a visible neck crease. The U-shaped blowhole is open toward the front, the reverse of the situation in most dolphin species.

The back and sides of Irrawaddy dolphins are grey to bluish grey; the belly is somewhat lighter.

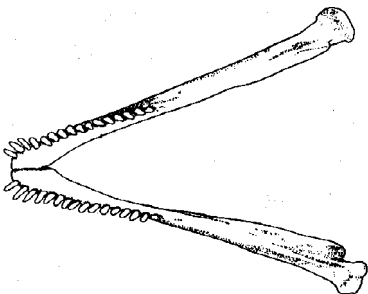
Tooth counts are 17 to 20 (upper) and 15 to 18 (lower) in each row. The teeth have slightly expanded crowns.



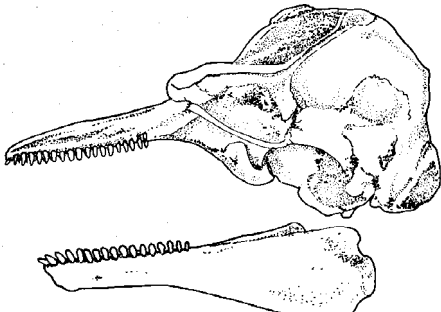
DORSAL VIEW



VENTRAL VIEW



DORSAL VIEW OF MANDIBLE



LATERAL VIEW

Fig. 271 Skull

**Can be confused with:** Irrawaddy dolphins can be confused with finless porpoises (p. 192) or dugongs (p. 212) in the parts of their range where these species overlap. When a clear view is obtained, Irrawaddy dolphins are distinguishable because neither of the other species has a dorsal fin.

**Size:** This is a relatively small dolphin: adults range from 2 to 2.75 m. Scant evidence indicates that the length at birth is about 1 m.

**Geographical Distribution:** Irrawaddy dolphins inhabit coastal, brackish, and fresh waters of the tropical and subtropical Indo-Pacific. They range from northern Australia and New Guinea to the Bay of Bengal, including at least the Irrawaddy, Mahakam, Mekong, Ganges, and Brahmaputra rivers. The range is poorly documented and is thought to be more extensive than shown.

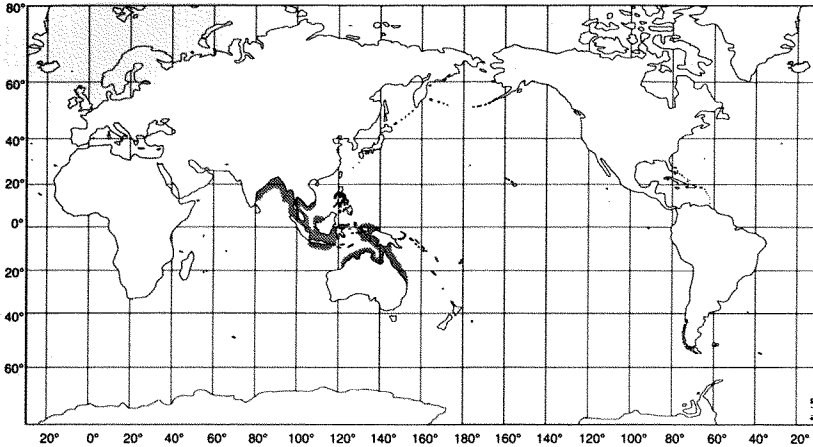


Fig. 272

**Biology and Behaviour:** Groups of fewer than 6 individuals are most common, but sometimes up to 15 dolphins are seen together. Irrawaddy dolphins have been seen in the same area as bottlenose and Indo-Pacific hump-backed dolphins. Irrawaddy dolphins are not particularly active, but do make low leaps on occasion. They are not known to bowride.

The calving season is not well known. Some calves appear to have been born from June to August, but 1 captive female gave birth in December.

Fishes, cephalopods, and crustaceans are taken as food. They sometimes spit water while feeding, apparently to herd fish.

**Exploitation:** Shark gillnets in Australia and fish traps and other types of nets throughout the range are known to take some Irrawaddy dolphins. Some small-scale hunting by local people probably occurs in many areas of its range.

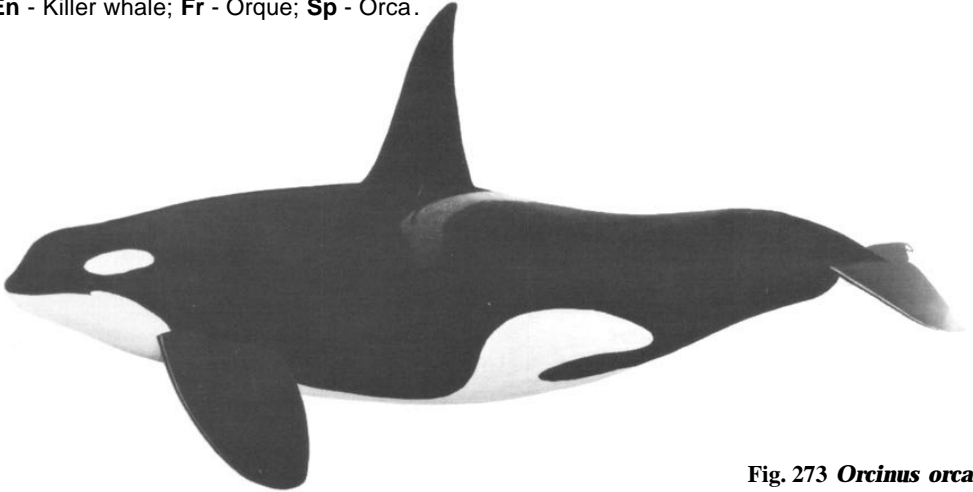
**IUCN Status:** Insufficiently known.

***Orcinus orca*** (Linnaeus, 1758)

DELPH Orc 1

KIW

FAO Names: En - Killer whale; Fr - Orque; Sp - Orca.

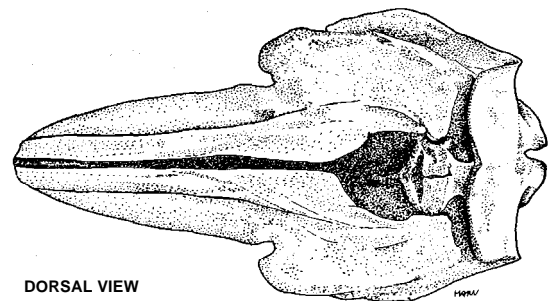
Fig. 273 *Orcinus orca*

**Distinctive Characteristics:** Killer whales are among the most distinctive, and therefore easily identified, of all cetaceans. The tall erect dorsal fin is nearly as distinctive as the colour pattern. It may reach 0.9 m in females and 1.8 m in males. Adult males tend to have dorsal fins that are triangular or that may even cant forward to varying degrees. Killer whales have blunt snouts, with only very short and poorly defined beaks. The flippers are large and oval, and grow to lengths of up to 2 m in bulls.

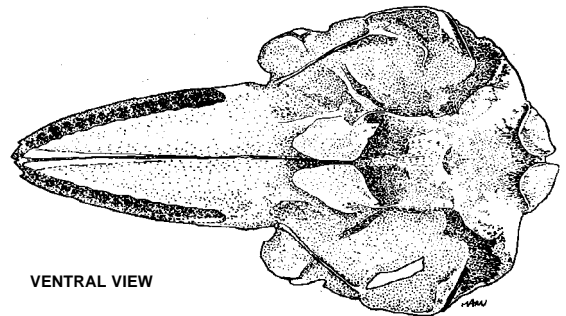
The black-and-white colour pattern is unmistakable. The lower jaw, undersides of the flukes, and ventral surface from the tip of the lower jaw to the urogenital area is white. White lobes extend up the sides behind the dorsal fin, and there is a white oval patch above and behind each eye. The rest of the body is black, except for a light-grey "saddle patch" behind the dorsal fin. In some populations, the dorsal coloration includes a narrow black cape, below which the dark areas are more nearly charcoal grey.

There are 10 to 12 large, recurved teeth in each half of both jaws, which are oval in crosssection. In older animals, they are often worn and damaged by abscesses.

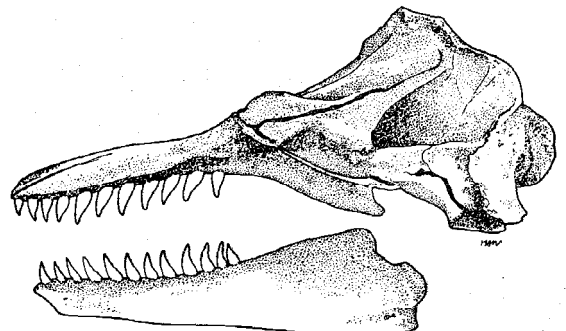
**Can be confused with:** Killer whales are easily recognizable to almost anyone who has spent time on the water or along the coast in areas they frequent. The great size of the dorsal fin (especially of adult males) and unique black and white colour pattern are diagnostic. At a distance, groups without adult males can be confused with Risso's dolphins (p. 152) and false killer whales (p. 126).



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 274 Skull



Fig. 275 Surface - blow - dive profile

**Size:** Newborn killer whales are 2.1 to 2.4 m in length and about 180 kg in weight. Adult females are up to 8.5 m and 7 500 kg; adult males up to 9.8 m and nearly 10 000 kg.

**Geographical Distribution:** This is probably the most cosmopolitan of all cetaceans. They can be seen in literally any marine region, and killer whales have even been known to ascend rivers. Killer whales are found in all oceans and seas, from the ice edges to the equator, in both hemispheres; however, they appear to be more common in nearshore, cold temperate to subpolar waters.

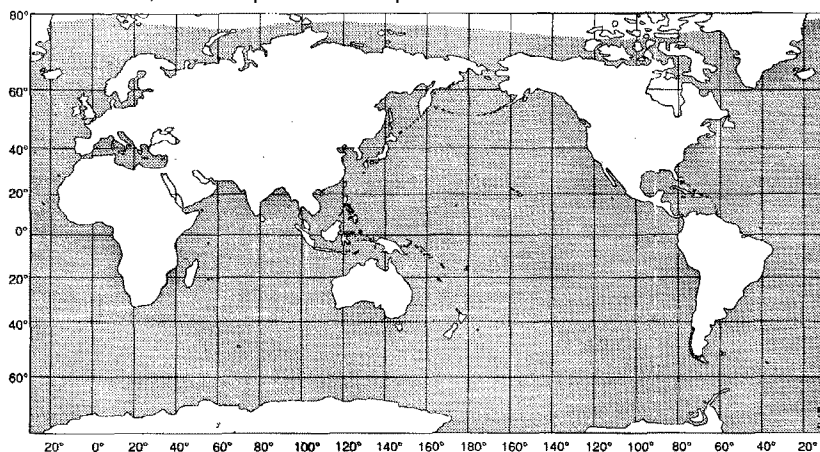


Fig. 276

**Biology and Behaviour:** Studies in the eastern North Pacific, from Washington State to Alaska, have distinguished 2 types of killer whales, referred to as residents and transients. Although differentiated by ecological differences, there are also differences in coloration and external morphology. In Washington and British Columbia, at least, residents are primarily fish eaters and transients eat mostly marine mammals. Some studies in other parts of the world suggest that this pattern may be universal. Pods of resident killer whales in British Columbia and Washington represent one of the most stable societies known among non-human mammals; individuals stay in their natal pod throughout life. Differences in dialects among sympatric groups appear to help maintain pod discreteness. Most pods contain 1 up to 55 whales and resident pods tend to be larger than those of transients.

In the Pacific Northwest, calving occurs in non-summer months, from October to March. Similarly, in the northeast Atlantic, it occurs from late autumn to mid-winter.

Though best known for their habits of preying on warm-blooded animals (killer whales are known to have attacked marine mammals of all groups, from sea otters to blue whales, except river dolphins and manatees), killer whales often eat various species of fish and cephalopods. Killer whales also occasionally eat seabirds and marine turtles.

**Exploitation:** Pelagic whaling activities have rarely directed their attention towards killer whales, but whaling fleets have taken a few in most years. Very small numbers of killer whales were taken in the North Pacific by now-defunct shore whaling stations. Fishermen in many areas see killer whales as competitors, and shooting of whales is known to occur. This problem is especially serious in Alaska, where conflicts with longline fisheries occur. Small numbers are taken incidentally in fisheries in many areas. Live captures for public display have been banned in most areas of the eastern North Pacific. Subsequently, live capture activities shifted to Iceland, but in 1991, the Icelandic government announced that once current permits for live capture expire, no new ones will be issued.

**IUCN Status:** Insufficiently known.

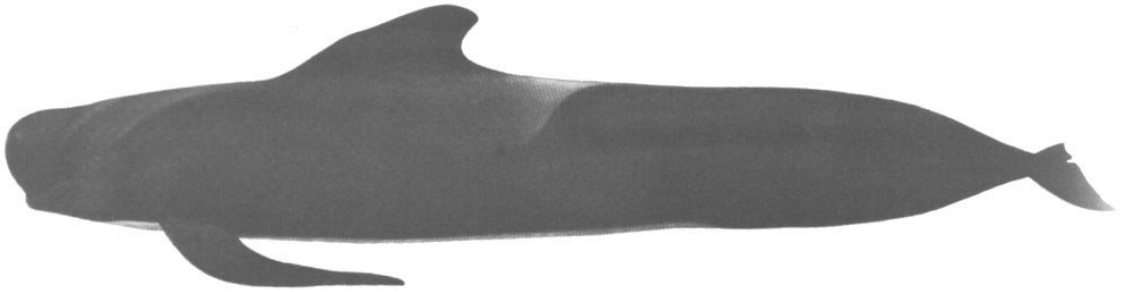
***Globicephala melas*** (Traill, 1809)

DELPH Glob 1

PIW

**FAO Names:** En - Long-finned pilot whale; Fr - Globicéphale commun; Sp - Calderón común

**Other scientific names still in use:** *Globicephala melaena* (Traill, 1809).

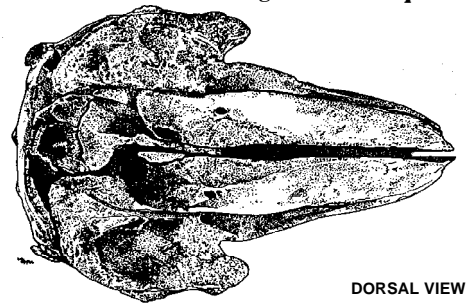


**Fig. 277 *Globicephala melas***

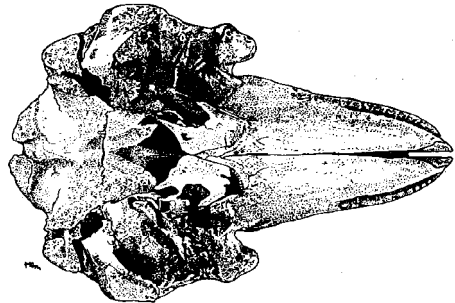
**Distinctive Characteristics:** Externally, the long-finned pilot whale resembles its short-finned relative. The head is globose, with an upsloping mouthline. The flippers are extremely long (18 to 27% of the body length) and slender, with pointed tips and an angled leading edge that forms an “elbow.” The dorsal fin is about one-third of the way back from the snout tip, and is low, wide-based, and falcate. The tail stock is deepened (remains of more-or-less uniform height from the saddle patch to just ahead of the flukes). Males have a larger, more bulbous head; larger, thicker dorsal fin; and deeper tail stock than do females.

Predominantly dark brownish grey to black, pilot whales have a white to light grey anchor-shaped patch on the chest, a light grey “saddle” behind the dorsal fin, and light grey “eyebrow” streaks.

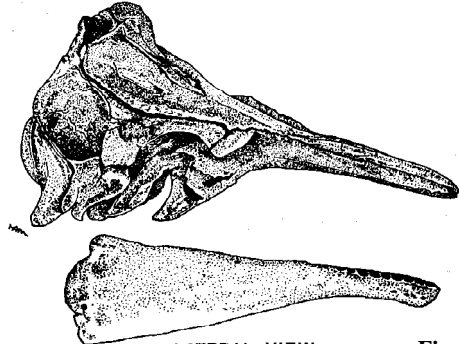
Inside the mouth are 8 to 13 pairs of sharp, pointed teeth in the anterior part of each jaw.



**DORSAL VIEW**



**VENTRAL VIEW**



**LATERAL VIEW**

**Fig. 278 Skull**

**Can be confused with:** In some temperate waters, long-finned and short-finned (p. 124) pilot whales overlap in distribution. In these areas, the 2 species will be extremely difficult to distinguish at sea. Tooth counts and relative flipper lengths (both of which are generally not useful in at sea sightings) are helpful means of separating the 2. In the lower latitude areas of its range, the long-finned pilot whale can be confused with false killer (p. 126) and less likely, pygmy killer (p. 128) and melon-headed (p. 130) whales; however, the differences in head shape and dorsal-fin shape and position should permit correct identification.

**Size:** Newborns are 1.7 to 1.8 m long. Adults reach 6.7 m (males) and 5.7 m (females) in length. Bulls reach weights of 2 000 kg.

**Geographical Distribution:** Long-finned pilot whales occur in temperate and subpolar zones. They are found in oceanic waters and some coastal waters of the North Atlantic Ocean. They were previously found in the western North Pacific, but appear to be absent there today. The circum-antarctic population(s) in the Southern Hemisphere are isolated from those of the Northern Hemisphere.

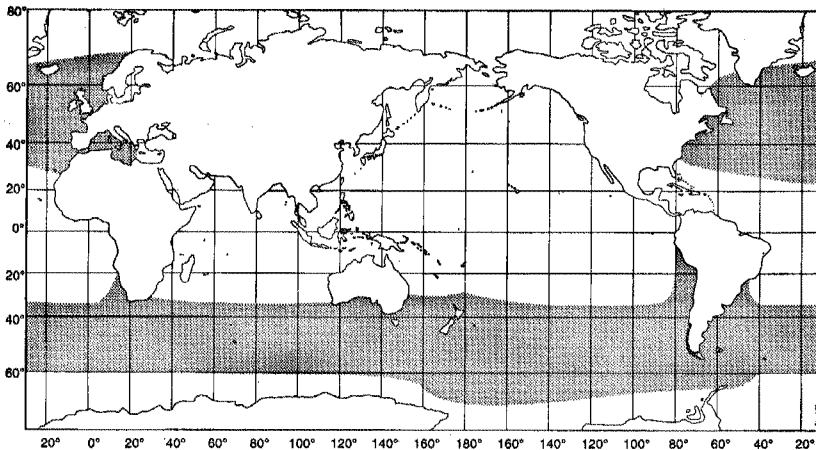


Fig. 279

**Biology and Behaviour:** Pilot whales are highly social; they are generally found in pods of about 20 to 100, but some groups contain more, to over 1 000. Based on photo-identification and genetic work, pilot whales appear to live in relatively stable pods like those of killer whales, and not in fluid groups characteristic of many smaller dolphins.

The mating system is hypothesized to be polygynous, which is consistent with the observed sexual dimorphism and adult sex ratio. Pilot whales are apparently deep divers. Groups often forage in broad ranks, sometimes with other species. Although they sometimes are aerially active, pilot whales are often seen rafting in groups at the surface, apparently resting.

This is one of the species most often involved in mass strandings. Strandings are fairly frequent, for instance, on Cape Cod (Massachusetts, USA) beaches from October to January. Their tight social structure also makes pilot whales vulnerable to herding, and this has been taken advantage of by whalers in drive fisheries off Newfoundland, the Faeroe Islands, and elsewhere.

Breeding can apparently occur at any time of the year, but peaks occur in summer in both hemispheres. Mating occurs primarily in spring to summer.

Primarily squid eaters, pilot whales will also take small medium-sized fish, when available.

**Exploitation:** The major exploitation of this species is probably the drive fisheries that were mentioned above. Today they are only taken in Greenland and the Faeroe Islands, but in the past, Newfoundland, Norway, Iceland, Shetland, Orkney, and the Hebrides were also sites of fisheries. Pilot whales are also known to be taken incidentally in trawl and gillnet fisheries in the western North Atlantic, and in swordfish driftnets in the Mediterranean.

**IUCN Status:** Insufficiently known.

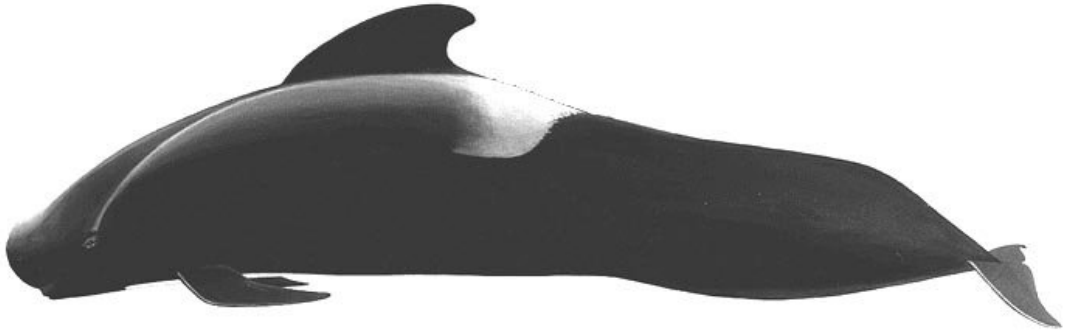


***Globicephala macrorhynchus*** Gray, 1846

DELPH Glob 2

SHW

**FAO Names:** En - Short-finned pilot whale; Fr - Globicephale tropical; Sp -Calderón de aletas cortas.

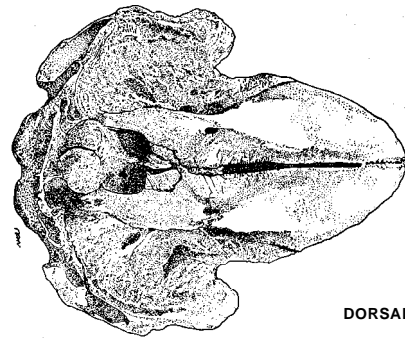


**Fig. 280 *Globicephala macrorhynchus***

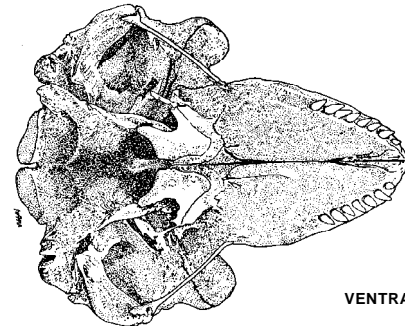
**Distinctive Characteristics:** Pilot whales are large, with bulbous heads, dramatically upsloping mouthlines, and extremely short or non-existent beaks. The shape of the head varies significantly with age and sex, becoming more globose in adult males. The dorsal fin, which is situated only about one-third of the way back from the head, is low and falcate, with a very wide base (it also varies with age and sex). The flippers are long and sickle-shaped, 16 to 22% of the body length. Adult males are significantly larger than females, with large, sometimes squarish foreheads that may overhang the snout, strongly hooked dorsal fins with thickened leading edges, and deepened tail stocks with post-anal keels.

Except for a light grey, anchor-shaped patch on the chest, a grey “saddle” behind the dorsal fin, and a pair of roughly parallel bands high on the back that sometimes end as a light streak or teardrop above each eye, pilot whales are black to dark brownish grey. This is the reason for one of their other common names, blackfish (although the term blackfish is variously used, usually by fishermen, to refer to killer, false killer, pygmy killer, pilot, and melon-headed whales).

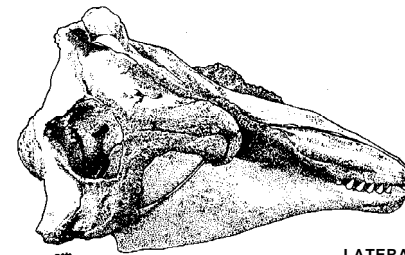
There are usually 7 to 9 short, sharply pointed teeth in the front of each tooth row.



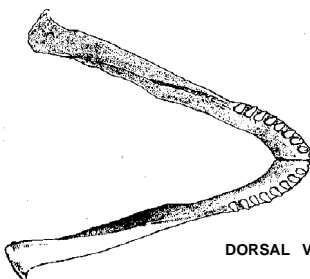
DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW



DORSAL VIEW OF MANDIBLE

**Fig. 281 Skull**

**Can be confused with:** In areas of overlap, the 2 pilot whales are difficult or impossible to distinguish at sea. Most sightings can be tentatively assigned to species, based on the area. Other smaller blackfish, such as false killer whales (p. 126), and less commonly, pygmy killer (p. 128) and melon-headed (p. 130) whales, may be confused with pilot whales at a distance. Dorsal-fin shape is the best clue to distinguishing pilot whales from these species.

**Size:** Pilot whales are about 1.4 m long at birth. Adults reach 5.5 m (females) and 6.1 m (males). Males may weigh nearly 3 600 kg.

**Geographical Distribution:** Short-finned pilot whales are found in warm temperate to tropical waters of the world, generally in deep offshore areas. They do not usually range north of 50°N or south of 40°. There is some distributional overlap with their long-finned relatives (*G. melas*), which appear to prefer cold temperate waters of the North Atlantic, Southern Hemisphere, and previously the western North Pacific. Only short-finned pilot whales are thought to inhabit the North Pacific, although distribution and taxonomy of pilot whales in this area are still largely unresolved. There are 2 geographic forms of short-finned pilot whales off Japan.

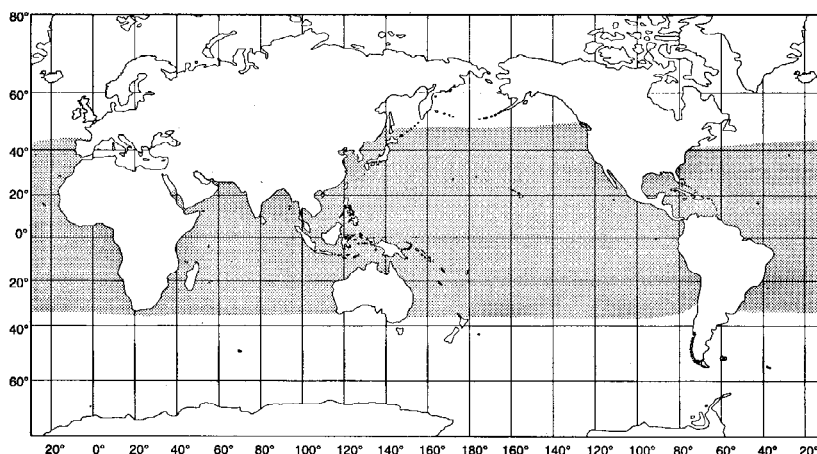


Fig. 282

**Biology and Behaviour:** In the eastern Pacific, pilot whales are commonly associated with other species (such as bottlenose, Pacific white-sided, and Risso's dolphins, and sperm whales). Pods of up to several hundred short-finned pilot whales are seen, and members of this highly social species are almost never seen alone. Strong social bonds may partially explain why pilot whales are among the species of cetaceans that most frequently mass-strand. Although detailed studies of behaviour have only begun recently, pilot whales appear to live in relatively stable female-based groups.

Females become post-reproductive at around 35 years, but may continue to suckle young for up to 15 additional years, suggesting a complex social structure in which older females may give their own or related calves a "reproductive edge" through prolonged suckling. Calving peaks occur in spring and autumn in the Southern Hemisphere, and vary by stock in the Northern Hemisphere.

Although they also take fish, pilot whales are thought to be primarily adapted to feeding on squid. They show the tooth reduction typical of other squid-eating cetaceans.

**Exploitation:** Short-finned pilot whales have been hunted throughout their range in small numbers, although not as heavily as their congeners in the North Atlantic. The largest catches have recently occurred off Japan, where small coastal whaling stations and drive fisheries take a few hundred annually. A catch of a few hundred per year existed until recently in the Caribbean, but numbers taken there have apparently declined. Incidental catches in fishing gear are known for several areas. A few have also been captured live off southern California for display and research.

**IUCN Status:** Insufficiently known.

***Pseudorca crassidens*** (Owen, 1846)

DELPH Pseu 1

FAW

FAO Names: En - False killer whale; Fr - Faux-orque; Sp - Orca falsa.



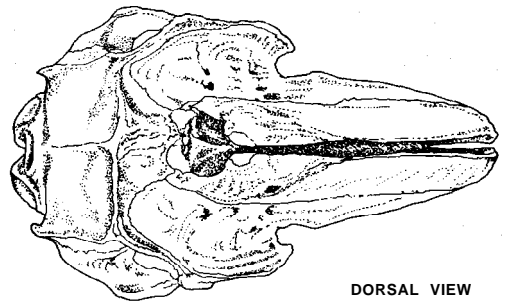
Fig. 283 *Pseudorca crassidens*

**Distinctive Characteristics:** The false killer whale is one of several species of delphinids that some fishermen call blackfish. It has a long slender body, a rounded overhanging forehead, and no beak. The dorsal fin is falcate and slender, and generally somewhat rounded at the tip. The flippers have a characteristic hump on the leading edge, perhaps the species' most diagnostic character.

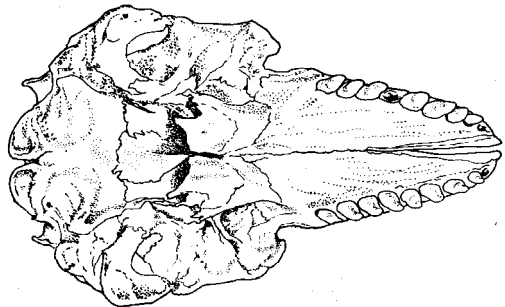
This is a large, dark grey to black dolphin, with a faint light grey patch on the chest, and sometimes light grey areas on the head.

Skulls of false killer whales from Australia, South Africa, and Scotland have been shown to differ, and this suggests the existence of different populations in these areas.

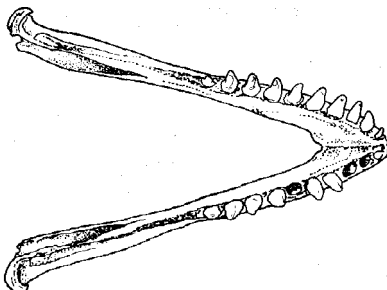
Each jaw contains 7 to 12 pairs of large conical teeth, which are round in cross-section.



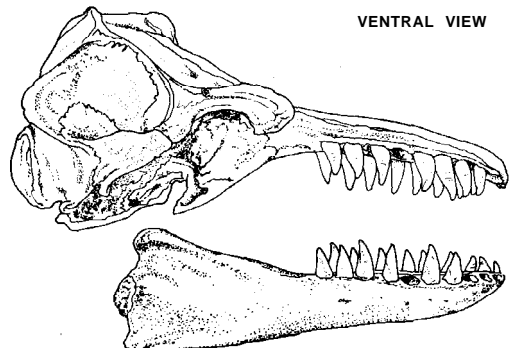
DORSAL VIEW



VENTRAL VIEW



DORSAL VIEW OF MANDIBLE



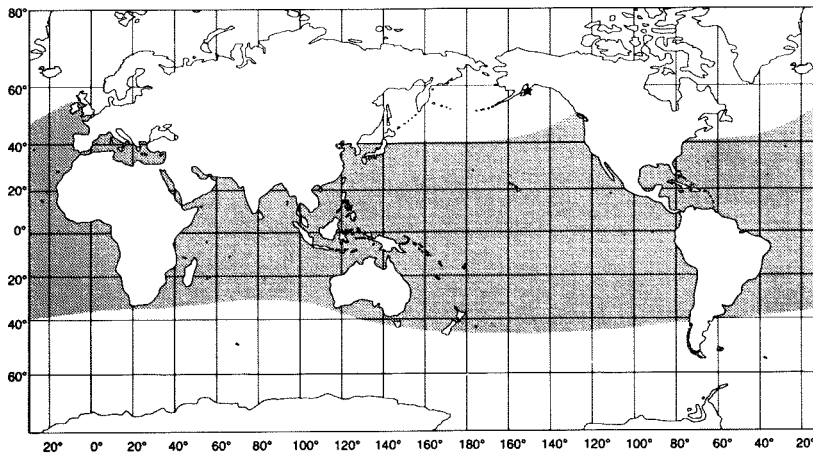
LATERAL VIEW

Fig. 284 Skull

**Can be confused with:** False killer whales are most commonly confused with pygmy killer (p. 128) and melon-headed (p. 130) whales, and less commonly, pilot whales (starting on p. 122). Shape of the head, dorsal fin, and flippers will be the best characters to use in distinguishing them (the flipper hump of false killer whales is diagnostic).

**Size:** Adults are up to 6 m (males) or 5 m (females) long. Large males may weigh up to 2 000 kg. Newborns are 1.5 to 2.1 m.

**Geographical Distribution:** False killer whales are found in tropical to warm temperate zones, in deep offshore waters. They generally do not range further north or south 50° in either hemisphere.



\* Extralimital record

Fig. 285

**Biology and Behaviour:** As is the case for most of the tropical oceanic delphinids, this species is poorly known. In some areas, false killer whales take bait from longlines and thus irritate fishermen. Groups of 10 to 60 are typical, though much larger groups are known. This is one of the most common species involved in cetacean mass strandings. The false killer whale is a lively, fast-swimming cetacean, which often behaves more like the spritely smaller dolphins than other mid-sized cetaceans.

No seasonality in breeding is known for the false killer whale.

Although false killer whales eat primarily fish and cephalopods, they also have been known to attack small cetaceans and, on one occasion, even a humpback whale.

**Exploitation:** Small numbers of false killer whales are taken in fishing nets and lines throughout their range, but only in Japan has there been a major catch. This is one of several species killed in the now infamous Iki Island drives, in which cetaceans are driven ashore and killed because they are held responsible for depleting an overfished stock of yellowtail amberjack (*Seriola lalandi*). A few may be shot by fishermen who regard them as competitors, and small numbers have been captured live off California and Hawaii. Incidental catches of small numbers occur in several areas.

**IUCN Status:** Insufficiently known.

***Feresa attenuata*** Gray, 1875

DELPH Fer 1

KPW

FAO Names: En - Pygmy killer whale; Fr - Orque pygmée; Sp- Orca pigmea.

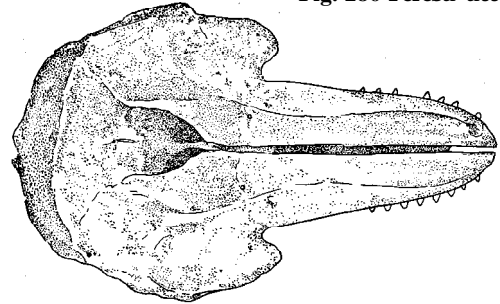


Fig. 286 *Feresa attenuata*

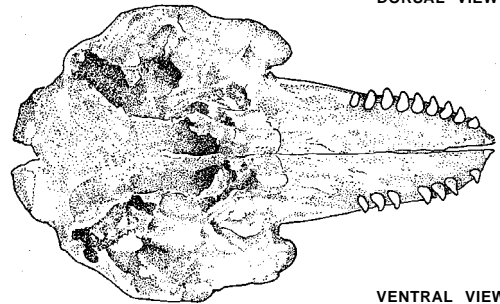
**Distinctive Characteristics:** The pygmy killer whale is often confused with the false killer whale and melon-headed whale. The best field character for distinguishing among these species is the flipper shape (rounded tips in the pygmy killer whale, pointed tips in the melon-headed whale, and humps on the leading edge in the false killer whale). The body of the pygmy killer whale is somewhat slender; the head is rounded and has no beak.

The colour of the body is dark grey to black, with a prominent narrow cape that dips only slightly below the dorsal fin, and a white to light grey ventral band that widens around the genitals. Also, the lips and snout tip are sometimes white.

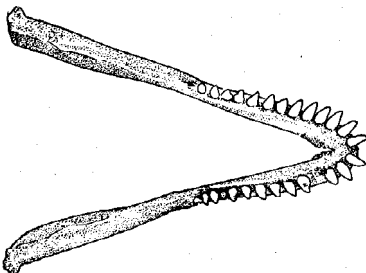
The upper jaw contains 8 to 11 pairs of teeth, and the lower jaw has 11 to 13 pairs.



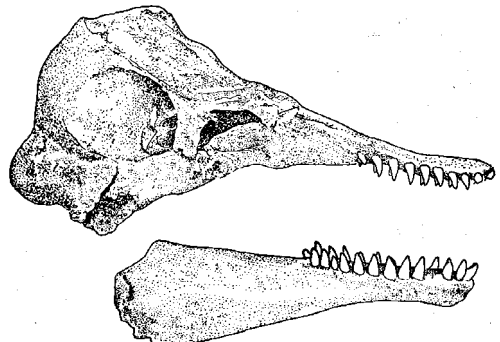
DORSAL VIEW



VENTRAL VIEW



DORSAL VIEW OF MANDIBLE



LATERAL VIEW

Fig. 287 Skull

**Can be confused with:** Pygmy killer whales are most easily confused with melon-headed whales (p. 130), and less easily with false killer whales (p. 126). Flipper shape, head shape, and the contour of the cape are the best features to use in distinguishing pygmy killer and melon-headed whales.

**Size:** Newborns are about 80 cm long, adults up to 2.6 m. Males are slightly larger than females. Maximum known weight is 225 kg.

**Geographical Distribution:** This is a tropical and subtropical species that inhabits oceanic waters around the globe, generally not ranging north of 40°N or south of 35°S.

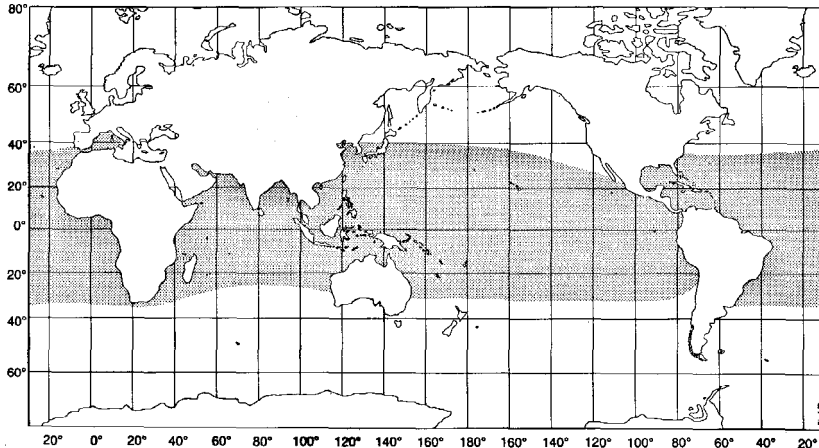


Fig. 288

**Biology and Behaviour:** There is little known of the biology of the pygmy killer whale. Groups generally contain 50 or fewer individuals, although herds of up to several hundred have been seen. It is slow and lethargic compared to the similar-appearing melon-headed whale.

Not much is known of the reproductive biology of this species.

Pygmy killer whales eat mostly fish and squid, although they occasionally attack other dolphins, at least when those dolphins are involved in tuna fishery interactions in the eastern tropical Pacific.

**Exploitation:** A few individuals are known to be taken in drives and in driftnets in various regions, most notably Japan and Sri Lanka. Small incidental catches are known in fisheries in other areas.

**IUCN Status:** Insufficiently known.

***Peponocephala electra*** (Gray, 1846)

DELPH Pep 1

MEW

**FAO Names:** En - Melon-headed whale; Fr - Péponocéphale; Sp- Calderón pequeño.

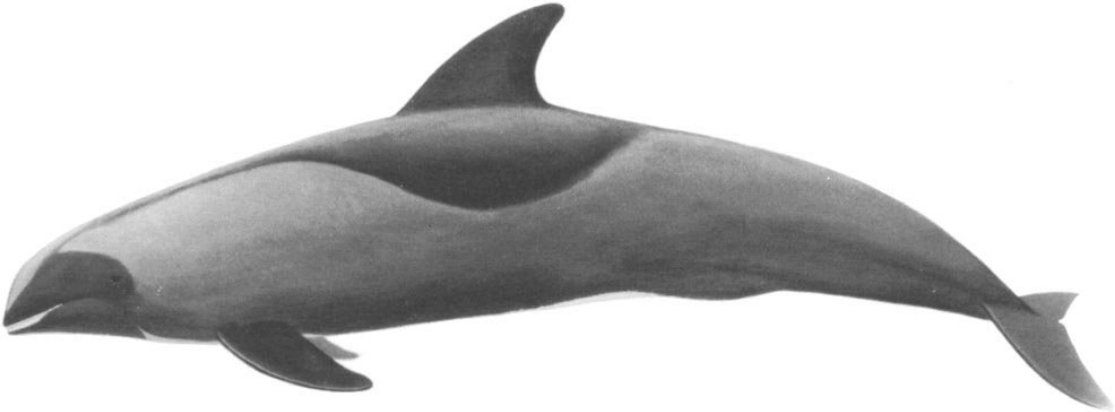
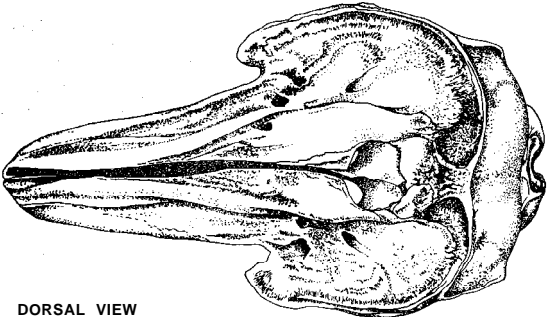


Fig. 289 *Peponocephala electra*

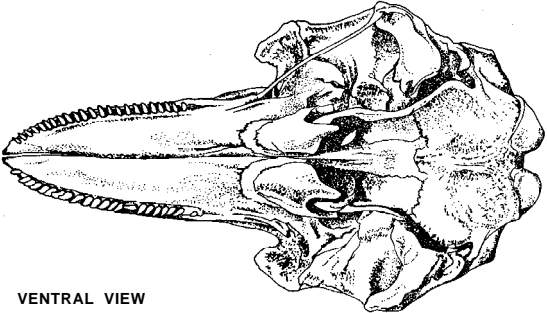
**Distinctive Characteristics:** At sea, melon-headed whales are often difficult to distinguish from pygmy killer whales. Major differences are that the melon-headed whale has pointed flippers and larger numbers of smaller teeth (pygmy killer whales have rounded flippers and only 8 to 13 pairs of more robust teeth). Also, melon-headed whales tend to have a more triangular head shape (when viewed from above or below), and females and young have a beak, albeit very short and poorly defined.

The body is generally charcoal grey to black, with white lips and a white urogenital patch. The black triangular “mask” on the face of melon-headed whales distinguishes them from the more uniformly coloured pygmy killer whales. Melon-headed whales also have a cape that dips much lower below the dorsal fin than that of pygmy killer whales, although its margin is often faint. There is a light stripe from the blowhole to the snout tip, which widens anteriorly.

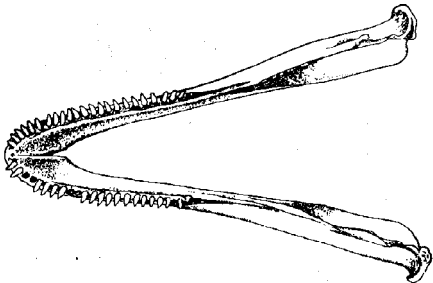
Melon-headed whales have 20 to 25 small slender teeth in each tooth row.



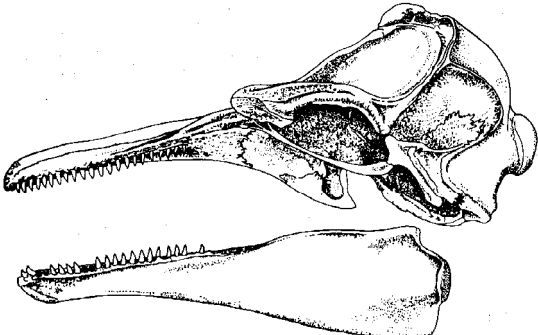
DORSAL VIEW



VENTRAL VIEW



DORSAL VIEW OF MANDIBLE



LATERAL VIEW

Fig. 290 Skull

**Can be confused with:** Melon-headed whales are difficult to distinguish from pygmy killer whales (p. 128) at sea. Head shape, flipper shape, and the sweep of the cape can be useful in identification. False killer whales (p. 126) can also be confused with this species at a distance.

**Size:** Melon-headed whales reach a maximum of about 2.75 m. Maximum known weight is about 275 kg. Length at birth is thought to be about 1 m or less.

**Geographical Distribution:** The range of the melon-headed whale coincides almost exactly with that of the pygmy killer whale in tropical and subtropical oceanic waters between 40°N and 35°S

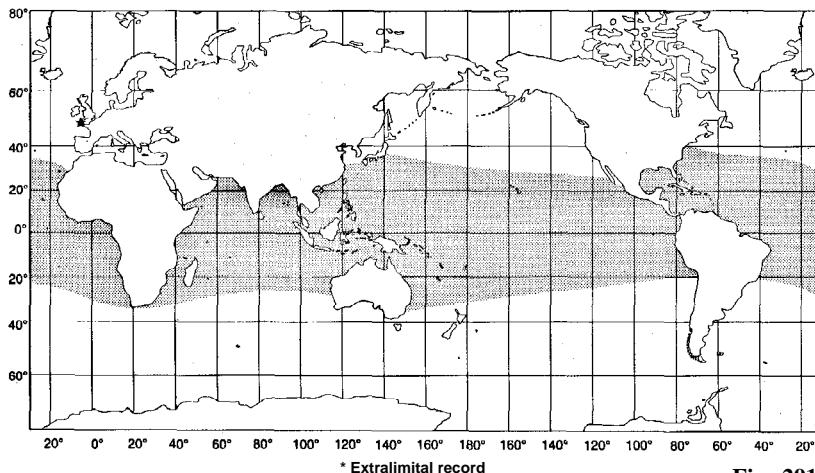


Fig. 291

**Biology and Behaviour:** Melon-headed whales are highly social, and are known to occur usually in pods of 100 to 500 (with a known maximum of 2 000 individuals). They are often seen swimming with other species, especially Fraser's dolphins, in the eastern tropical Pacific, Philippines, and Gulf of Mexico. Melon-headed whales often move at high speed, porpoising out of the water regularly, and are eager bowriders, often displacing other species from the bow wave.

There is some evidence to indicate a calving peak in July and August, but this is inconclusive.

Melon-headed whales are known to feed on squid and small fish.

**Exploitation:** A few melon-headed whales are known to be taken in purse seine and driftnet fisheries, and some are killed in drive fisheries in Japan, and in other directed fisheries in tropical regions of the world. Several individuals of this species have been captured for display in oceanaria.

**IUCN Status:** Insufficiently known.



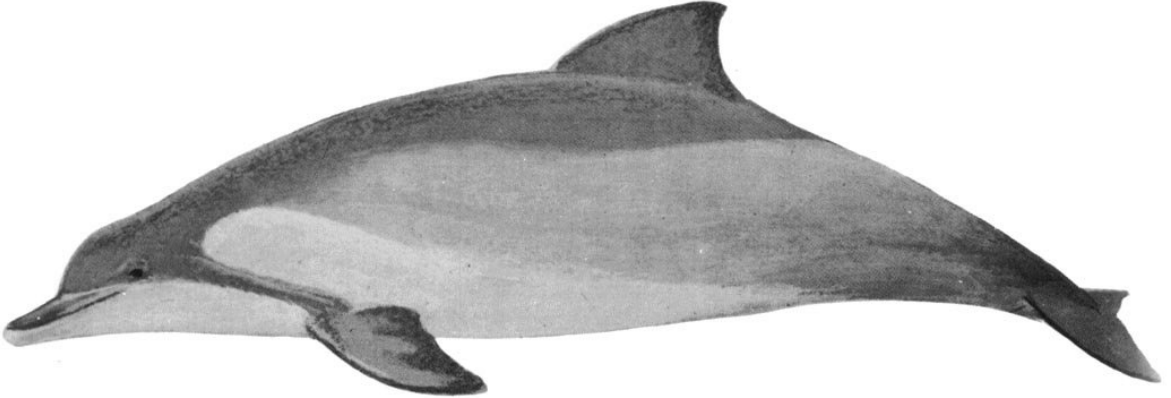
***Sotalia fluviatilis*** (Gervais, 1853)

DELPH Sot 1

TUC

**FAO Names:** En - Tucuxi; Fr - Sotalia; Sp - Bufo negro.

(Note - there are currently no agreed-upon common names for coastal ***Sotalia***. The name tucuxi is used by locals only for the riverine animals. Brazilian fishermen call the marine animals boto or golfinho.)

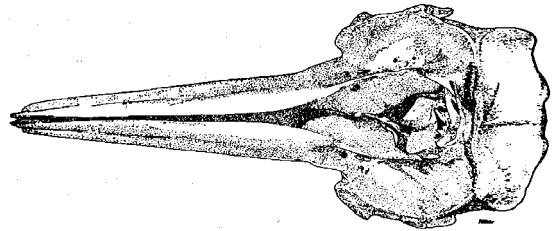
Fig. 292 *Sotalia fluviatilis*

**Distinctive Characteristics:** This small dolphin resembles the bottlenose dolphin (p. 154) in body shape: it is rather chunky. The snout is longer and narrower, the flippers are broader, and the dorsal fin is shorter and more triangular than in the bottlenose dolphin.

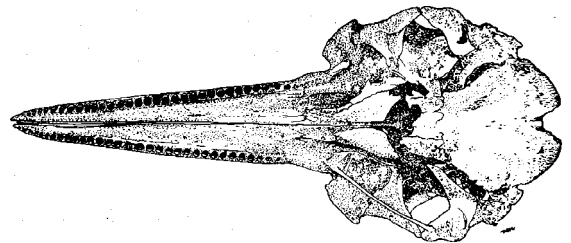
Dorsally, dolphins of the genus ***Sotalia*** are dark bluish or brownish grey, fading to light grey or white on the belly. Much of the light ventral area may be pinkish. There is a broad, somewhat indistinct stripe from the eye to the flipper and often light tones on the sides above the flippers.

The mouth contains 26 to 35 teeth in each row.

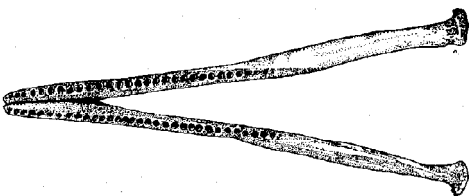
There are 2 forms of ***Sotalia***, one found in rivers and lakes, and another in marine waters. Most of the information available on the species' biology comes from studies of the riverine form, and may not apply to those along the coast.



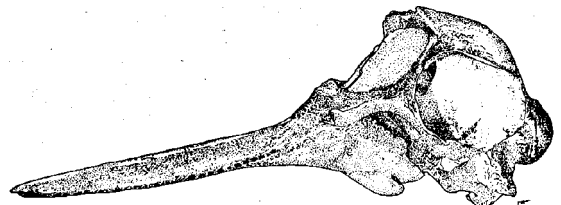
DORSAL VIEW



VENTRAL VIEW



DORSAL VIEW OF MANDIBLE



LATERAL VIEW

Fig. 293 Skull

**Can be confused with:** In the rivers, it is often difficult to distinguish Tucuxi from Boto (p. 198) at a distance. Up close, however, differences in dorsal-fin shape, head shape, and behaviour are the best clues to distinguishing them. Bottlenose dolphins could be mistaken for *Sotalia* along the coast, but they are much larger, with taller dorsal fins. Franciscana (p. 202) might also be difficult to distinguish from *Sotalia* in coastal waters. The franciscana has a larger body, much longer snout, and squarish (rather than pointed) flippers.

**Size:** Adult dolphins of the genus *Sotalia* are up to 2.1 m (coastal) and 1.6 m (riverine) in length. They reach weights of up to at least 40 kg. Size at birth is between 0.7 and 0.8 m.

**Geographical Distribution:** This dolphin is found mostly nearshore and in estuaries along the Atlantic coast, from Panama (perhaps Honduras) to southern Brazil. There are separate marine and freshwater populations. The latter are found in the Amazon and Orinoco drainage basins, as far inland as southern Peru, eastern Ecuador, and southeastern Colombia.

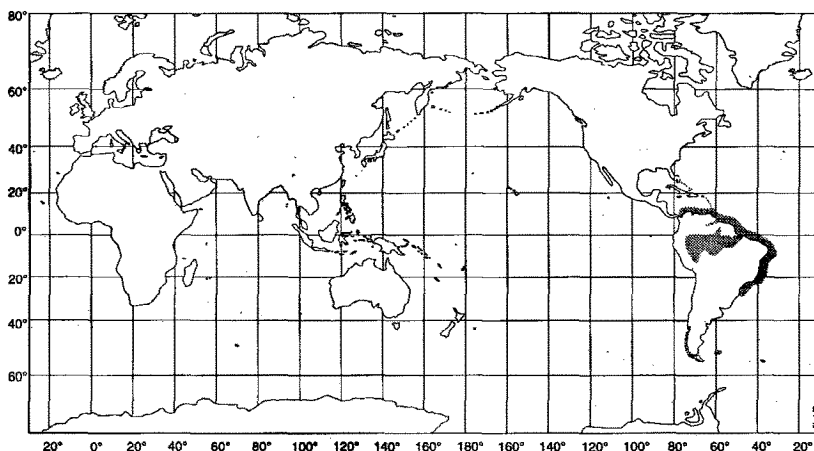


Fig. 294

**Biology and Behaviour:** Dolphins of the genus *Sotalia* live mostly in groups of 4 or fewer, although they are found in groups of up to 20 (in freshwater) or 50 (in marine waters). They are generally shy and difficult to approach. During the flood season, riverine animals may move into smaller tributaries, but apparently do not move into the inundated forest to feed (as boto do), staying mostly in the main river channels.

In Brazil, calving in the riverine form apparently occurs primarily during the low water period, October to November. Little else is known of the species' reproduction.

A wide variety of fish, mostly small schooling species, are eaten by riverine tucuxi. Those along the coast consume pelagic and demersal fish and cephalopods.

**Exploitation:** Coastal and riverine *Sotalia* are taken in gillnets, seines, and shrimp traps. In the Amazon, there may be some direct captures, and there is at least one record of harpooning a coastal animal. The coastal form is sometimes used for human consumption and as shark bait. Damming of the Amazon River potentially can cause isolation of segments of the population and reduce food supplies. Destruction and degradation of mangroves and exposure to polluted waters are other potential problems for this species.

**IUCN Status:** Insufficiently known.

***Sousa chinensis*** (Osbeck, 1765)

DELPH Sou 1

DHI

**FAO Names:** **En** - Indo-Pacific hump-backed dolphin; **Fr** - Dauphin à bosse de l'Indo-Pacifique; **Sp** - Delfín jorobado del Pacífico.

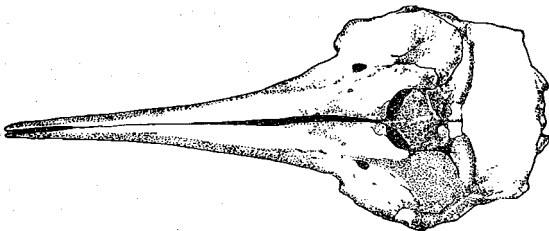


Fig. 295 *Sousa chinensis*

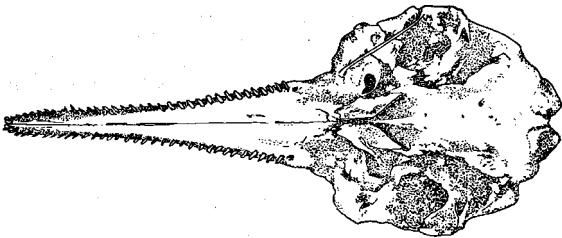
**Distinctive Characteristics:** Dolphins of this highly variable species are characterized by a robust body with a long, well-defined beak. In most populations (especially those off southern Africa), the dorsal fin sits on a hump, or ridge, in the middle of the animal's back. In others the ridge appears to be absent, or less well-developed. In most areas, there also appear to be well-developed ridges on the tail stock. Males are larger and have more exaggerated ridges on the back and tail stock.

The colour pattern varies with age and area. In most regions, light coloured calves darken with age to become dark lead grey above and light grey below. However, off Malaysia and northern Australia calves and adults are nearly white. In the western Indian Ocean and off China dark calves lighten with age. In the latter case, adults are pinkish white with spots and blotches.

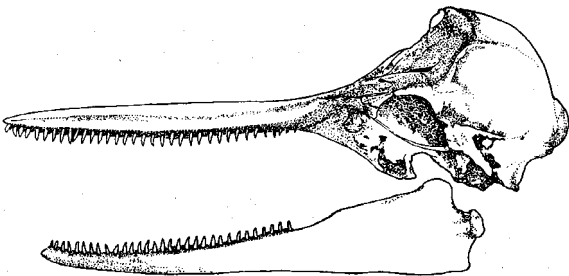
There are 29 to 38 teeth in each tooth row.



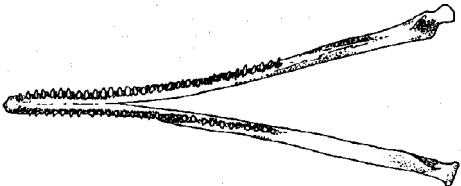
DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW



DORSAL VIEW OF MANDIBLE

Fig. 296 Skull

**Can be confused with:** Hump-backed dolphins are most likely to be confused with bottlenose dolphins (p. 154). Differences in dorsal-fin shape (including presence of the hump on many hump-backed dolphins), head shape, and colour can be used to distinguish between the 2. Also, humpbacks tend to surface differently, pausing at the top of their roll.

**Size:** Maximum known body sizes are 3.2 m (males) and 2.5 m (females). Weights of up to 284 kg have been recorded. Newborns appear to be around 1 m in length.

**Geographical Distribution:** Indo-Pacific hump-backed dolphins are found from northern Australia and southern China in the east, through Indonesia, and around the coastal rim of the Indian Ocean to southern Africa. They are inhabitants of tropical to warm temperate coastal waters and they enter rivers, estuaries, and mangroves.

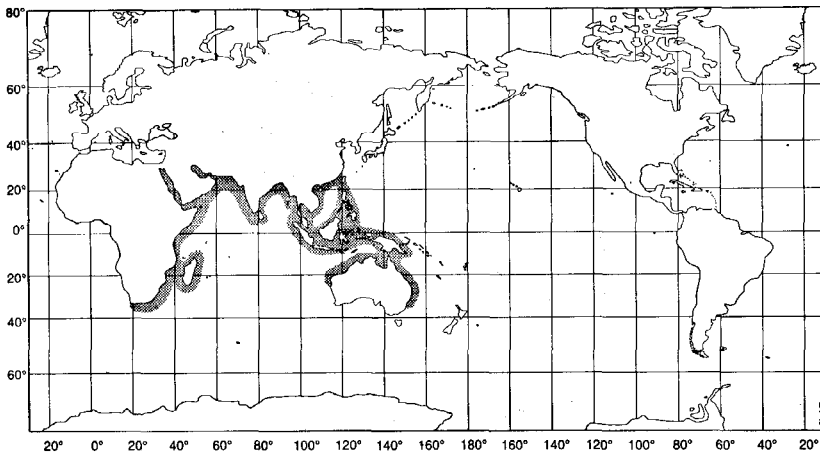


Fig. 297

**Biology and Behaviour:** Groups tend to contain fewer than 10 individuals, though some contain up to 30. Group structure has been studied using photo-identification techniques and off South Africa, some herds are stable. Also, off South Africa, where these dolphins have been most thoroughly studied, groups preferentially use sandy bays for resting and socializing, and open rocky coastline for foraging. Herds often patrol slowly parallel to shore. They are moderately acrobatic, but do not often bowride.

Mating and calving occur all year, at least in South Africa, but there appears to be a calving peak in summer.

Feeding is primarily on nearshore, estuarine, and reef fish.

**Exploitation:** In the northwest Indian Ocean, at least, some direct catches for human consumption and for oil are known. Incidental captures in fishing nets are known or suspected throughout the range. Catches occur in antishark gillnets off southeast Africa and off eastern Australia. Mortality off South Africa has been implicated as a population threat there. Mangrove habitat degradation may also present a threat to this species.

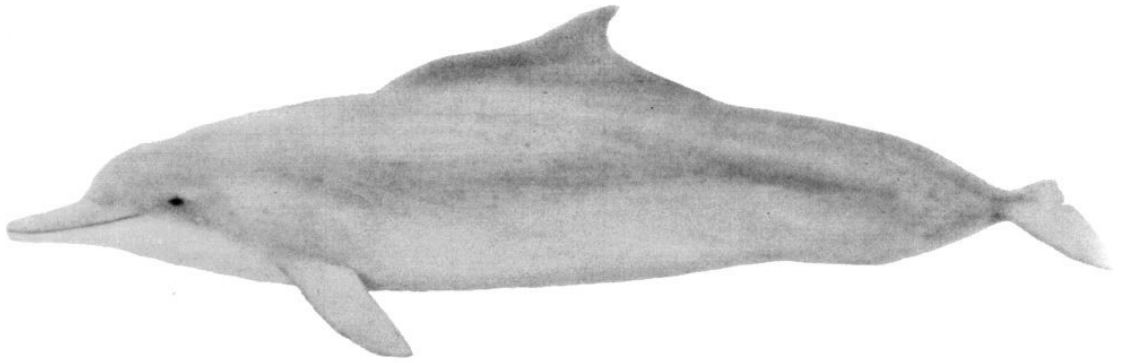
**IUCN Status:** Insufficiently known.

***Sousa teuszii*** (Kükenthal, 1892)

DELPH Sou 2

DHA

**FAO Names:** **En** - Atlantic hump-backed dolphin; **Fr** - Dauphin à bosse de l'Atlantique; **Sp** - Delfin jorobado del Atlantico.

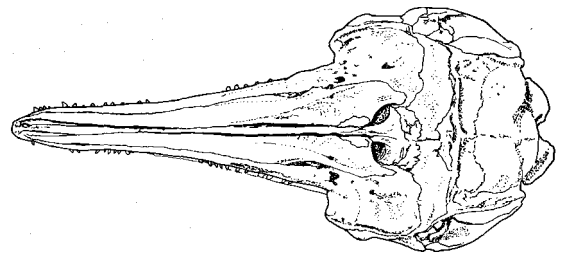


**Fig. 298 *Sousa teuszii***

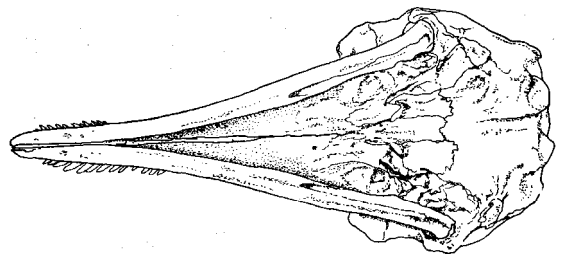
**Distinctive Characteristics:** Atlantic hump-backed dolphins have a long, distinct beak, broad flippers with rounded tips, and a moderately deepened tail stock. The dorsal fin is variable in shape, but generally emerges from a wide hump or ridge on the animal's back. Although this species is poorly known, it is probably sexually dimorphic, like the Indo-Pacific hump-backed dolphin.

Coloration is also variable. Animals are slate grey on the sides and back, and light grey below.

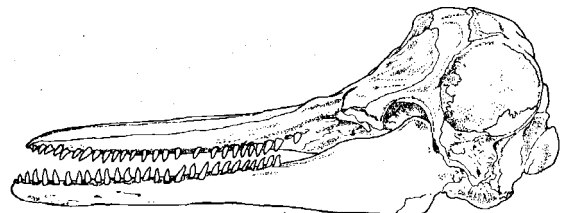
Tooth counts are 27 to 31 per upper tooth row, and 26 to 30 per lower row.



DORSAL VIEW WITH MANDIBLE



VENTRAL VIEW WITH MANDIBLE



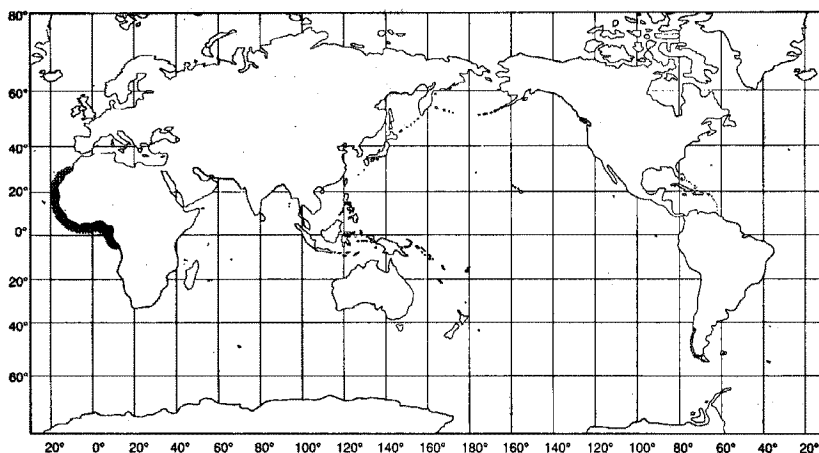
LATERAL VIEW

**Fig. 299 Skull**

**Can be confused with:** The bottlenose dolphin (p. 154) also inhabits the inshore range of the Atlantic hump-backed dolphin. The 2 can be distinguished by differences in beak length, dorsal-fin shape (including the hump), and coloration.

**Size:** Adults are up to about 2.8 m in length, and weigh up to 284 kg. Length at birth is thought to be about 1 m.

**Geographical Distribution:** Atlantic hump-backed dolphins occur off tropical to subtropical West Africa, from Mauritania south to at least Cameroon, possibly to northern Angola. They are found primarily in estuarine and coastal waters. Some hump-backed dolphins inhabit rivers, such as the Niger, but it is not known if there are separate freshwater populations.



**Fig. 300**

**Biology and Behaviour:** Groups generally contain 5 to 7 individuals, occasionally up to 25 animals. Groups often feed very near shore. These animals generally do not bowride.

Breeding has been documented in March and April, but the breeding season may be more protracted.

Hump-backed dolphins feed on schooling fishes and, contrary to some descriptions, probably do not eat vegetable matter. Off the coast of Mauritania, fishermen using beach seines cooperate with Atlantic hump-backed and bottlenose dolphins to capture mullet.

**Exploitation:** Hump-backed dolphins are taken in beach seines and shark nets in Senegal. There is apparently also some direct capture of small cetaceans in West Africa for human consumption. Also of concern are the effects of offshore foreign fishing and mangrove destruction.

**IUCN Status:** Insufficiently known.

***Steno bredanensis*** (Lesson, 1828)

DELPH *Steno* 1

RTD

FAO Names: En - Rough-toothed dolphin; Fr - Sténo; Sp - Esteno.

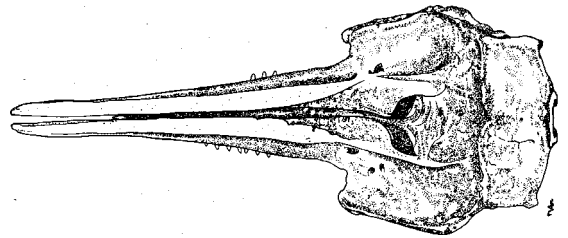


Fig. 301 *Steno bredanensis*

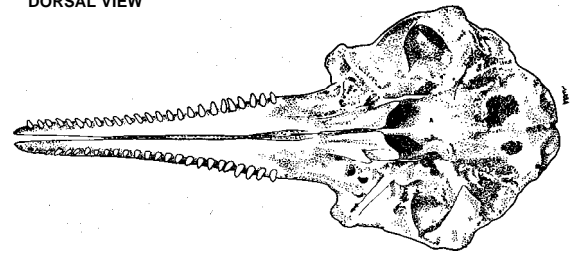
**Distinctive Characteristics:** The rough-toothed dolphin is relatively robust, with a conical head and no demarcation between the melon and the snout. It has a somewhat reptilean appearance. This species has large flippers (seemingly oversized for the animal) that are set far back on the side, and a prominent falcate dorsal fin.

The body is dark grey, with a prominent narrow dorsal cape that dips slightly down onto the side below the dorsal fin. The belly, lips, and much of the lower jaw are white, often with a pinkish cast. White scratches and spots, apparently mostly caused by bites of cookie-cutter sharks and probably other rough-toothed dolphins, often cover much of the body.

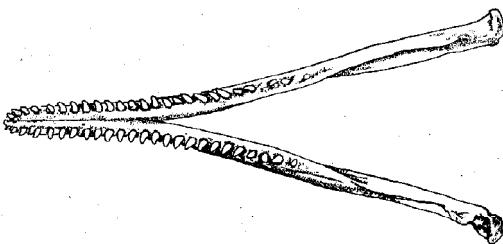
The 20 to 27 teeth in each row have subtle, but detectable, vertical wrinkles or ridges. These ridges give rise to the species' English common name.



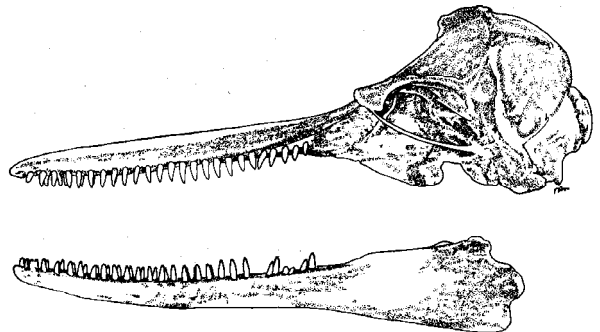
DORSAL VIEW



VENTRAL VIEW



DORSAL VIEW OF MANDIBLE



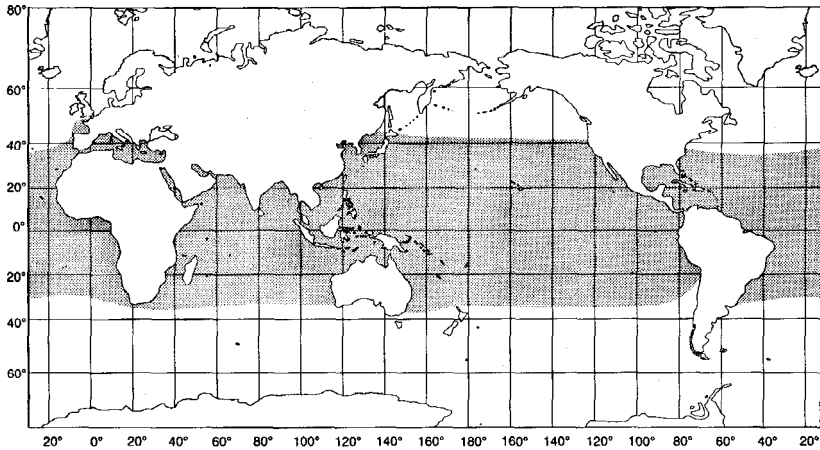
LATERAL VIEW

Fig. 302 Skull

**Can be confused with:** Rough-toothed dolphins are generally easy to identify when seen at close range; however, they may be mistaken for bottlenose dolphins (p. 154) if seen at a distance. The narrow cape and cone-shaped head are the best clues for identifying rough-toothed dolphins.

**Size:** Adults are up to about 2.8 m long. They are known to reach weights of up to 150 kg. Length at birth is unknown.

**Geographical Distribution:** The rough-toothed dolphin is a tropical to subtropical species, which inhabits deep oceanic waters, rarely ranging north of 40°N or south of 35°S.



**Fig. 303**

**Biology and Behaviour:** Rough-toothed dolphins have been seen most commonly in groups of 10 to 20, although herds of over 100 have been reported. They are often lethargic and individuals bowride occasionally. They often move at high speed with the chin and head above the surface, in a distinctive skimming behaviour described as "surfing." In the eastern tropical Pacific, they tend to associate with floating objects and sometimes with other cetaceans.

Rough-toothed dolphins feed on cephalopods and fish, including large fish such as mahi mahi (also called dorado or dolphinfish).

**Exploitation:** Rough-toothed dolphins are sometimes taken incidentally in purse seines in the eastern tropical Pacific, and in small numbers in directed fisheries in Japan, the Lesser Antilles, and Sri Lanka. A few have been captured live for public display.

**IUCN Status:** Insufficiently known.



***Lagenorhynchus obliquidens*** Gill, 1865

DELPH Lag 2

DWP

**FAO Names:** En - Pacific white-sided dolphin; Fr - Dauphin à flancs blancs du Pacifique; Sp - Delfín de costados blancos del Pacífico .

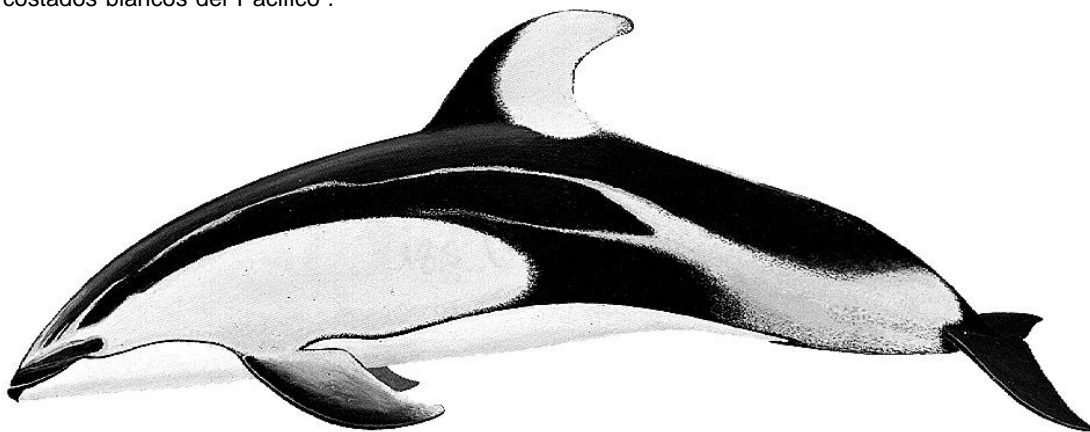
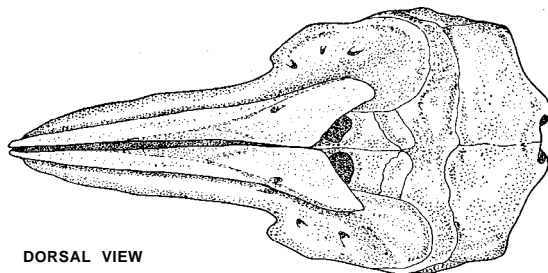


Fig. 304 *Lagenorhynchus obliquidens*

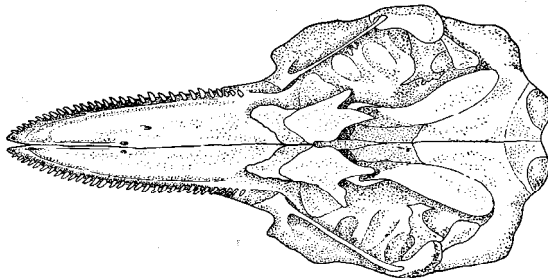
**Distinctive Characteristics:** Pacific white-sided dolphins, like all members of the genus *Lagenorhynchus*, are stocky animals with very short, thick snouts. The large flippers have slightly rounded tips. The dorsal fin, the species' most diagnostic feature, is prominent, strongly recurved, and bi-coloured.

The dark grey back and sides are distinctly set off from the white belly by a black border. Light grey streaks beginning on the sides of the melon sweep downwards behind the eye and expand into large grey thoracic patches. Grey "suspender stripes", which start above the eyes, widen to bands on the sides of the tail stock. The lips are black.

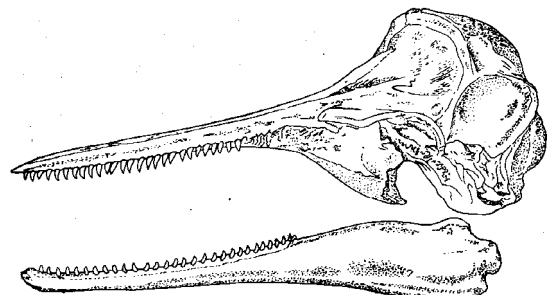
Each tooth row contains 23 to 36 pairs of relatively fine, sharply pointed teeth.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 305 Skull

**Can be confused with:** Pacific white-sided dolphins are most likely to be confused with common dolphins (p. 166), because both species are found in large schools and have large light coloured flank patches. Beak length and specifics of the colour pattern are the best keys to distinguishing them.

**Size:** Adults of this species reach 2.5 m in length, with males slightly larger than females. Maximum weight is about 180 kg. Length at birth is unknown, but is thought to be about 1 m.

**Geographical Distribution:** Pacific white-sided dolphins inhabit temperate waters of the North Pacific and some adjacent seas. Although they are widely distributed in deep offshore waters, they also extend onto the continental shelf and very near shore in some areas. They reach their southern limits at the mouth of the Gulf of California (and occasionally venture northward to or beyond La Paz) and Taiwan. On both eastern and western sides of the Pacific, separate local stocks have been documented.

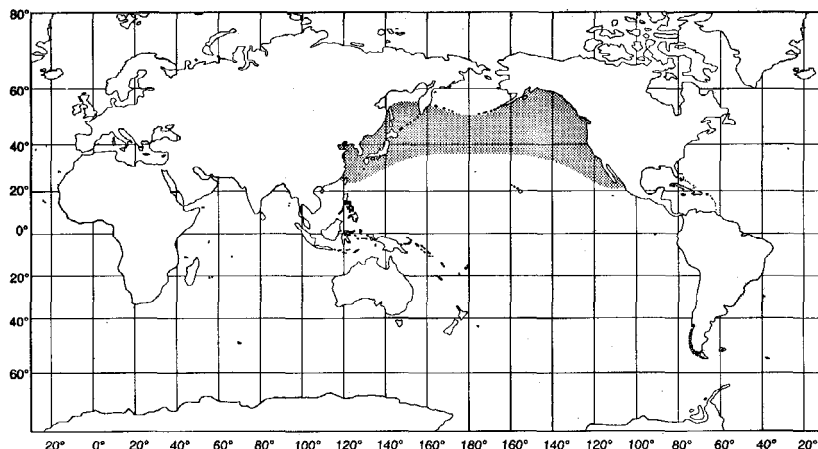


Fig. 306

**Biology and Behaviour:** Often seen in large herds of hundreds or even thousands, these highly gregarious dolphins are also commonly seen with other species, especially northern right whale dolphins and Risso's dolphins. They are highly acrobatic and playful, commonly bowriding, and often leaping, flipping, or somersaulting.

Calving apparently occurs during a protracted summer breeding season, which extends into autumn.

They feed mostly on small schooling fish and squid. There is evidence that these dolphins feed mostly on deep scattering layer (DSL) organisms, sometimes using cooperative foraging techniques.

**Exploitation:** In the western Pacific, Japanese drive and harpoon fisheries take hundreds or thousands of Pacific white-sided dolphins in most years. Exploitation in the eastern Pacific has been limited to occasional incidental capture in fishing nets, and small numbers taken in a fishery for live animals. In the central Pacific, white-sided dolphins were recently killed in substantial numbers in the Asian pelagic driftnet fisheries for squid. The annual kill was on the order of 8 000 to 10 000 per year.

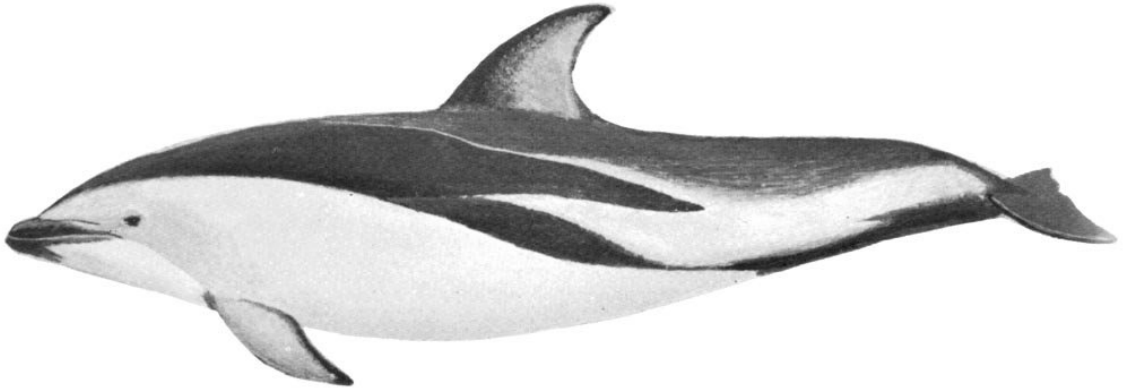
**IUCN Status:** Insufficiently known.

***Lagenorhynchus obscurus*** (Gray, 1828)

DELPH Lag 3

DDU

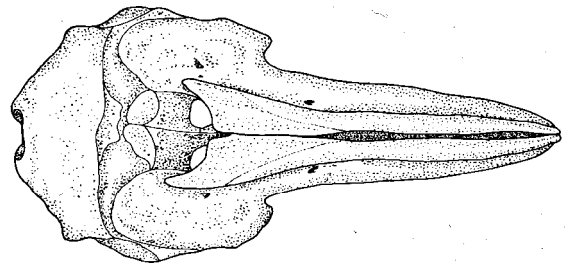
FAO Names: En - Dusky dolphin; Fr - Dauphin sombre; Sp - Delfín obscuro.

Fig. 307 *Lagenorhynchus obscurus*

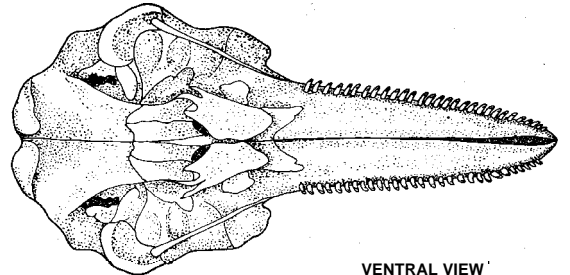
**Distinctive Characteristics:** The dusky dolphin is a small, moderately robust species. The rostrum is short and clearly demarcated from the melon (forehead). The conspicuous dorsal fin is moderately falcate and pointed. The flippers are moderately curved on the leading edge, with a blunt tip.

The body coloration is complex, and is generally countershaded, dark grey to black above and white below. The sides are marked with blazes and patches of pale grey. In front of the dorsal fin, they bear a broad light grey thoracic patch that encompasses the face, most of the head, and flanks, tapering towards the belly. A separate crescent-shaped flank patch reaches the top of the tail stock just in front of the flukes. The front of this flank patch splits into 2 blazes, a shorter ventral and a longer dorsal one; this latter narrows and stretches up onto the back, almost to the blowhole. The rostrum is grey-black around the tip, tapering back to darken just the lips near the gape. The eye is set in a small patch of grey-black. A variable crescent of pale grey contrasts the trailing half of the dorsal fin with the dark coloured front half, and the flippers are pale grey, but darken around the edges.

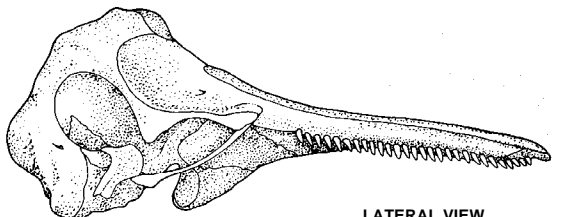
There are 27 to 36 small, pointed teeth on each side of each jaw.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 308 Skull

**Can be confused with:** At sea, dusky dolphins can be distinguished from the closely related, but larger and more robust, Peale's dolphin (p. 150) primarily by careful attention to differences in colour pattern.

**Size:** The maximum recorded length is 2.1 m.. Most adults are less than 2 m long. Healthy adults weigh 40 to 80 kg. Length at birth has been reported to be 55 to 70 cm.

**Geographical Distribution:** Dusky dolphins are widespread in the Southern Hemisphere. They occur in apparently disjunct populations in the waters off New Zealand, South America, and southern Africa. This is a coastal species and is usually found over the continental shelf and slope.

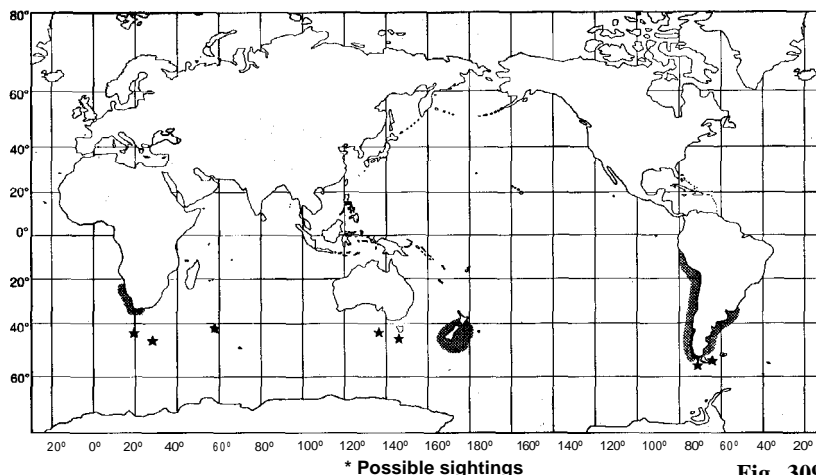


Fig. 309

**Biology and Behaviour:** Dusky dolphins are highly social, gregarious animals. They sometimes form impressive herds of over 1 000 individuals, but are more likely to occur in groups of 20 to 500. Dusky dolphins are one of the most acrobatic of dolphins, frequently leaping high out of the water, at times tumbling in the air. They readily approach vessels to engage in bowriding. Many species of cetaceans have been observed in association with dusky dolphins.

In New Zealand and Argentina, calving is believed to peak in summer (November to February).

Dusky dolphins take a wide variety of prey, including southern anchovy and mid-water and benthic prey, such as squid and lanternfishes. They may also engage in nocturnal feeding. Cooperative feeding is practiced commonly in some areas.

**Exploitation:** In New Zealand, some dusky dolphins are entangled in gill nets. Incidental mortality at one fishing port is estimated to be 100 to 200 animals per year. The situation in Peru is of greater concern. It has been calculated that the fishing industry from just one port kills more than 700 dusky dolphins each year. These dolphins are sold for food, so they are taken incidentally and as deliberate targets. Dusky dolphins are assumed to be relatively abundant throughout their range. However, very few surveys have been conducted and no population estimates are available.

**IUCN Status:** Insufficiently known.

***Lagenorhynchus albirostris*** (Gray, 1846)

DELPH Lag 4

BWD

**FAO Names:** En - White-beaked dolphin; Fr - Dauphin à bec blanc; Sp - Delfín de hocico blanco .

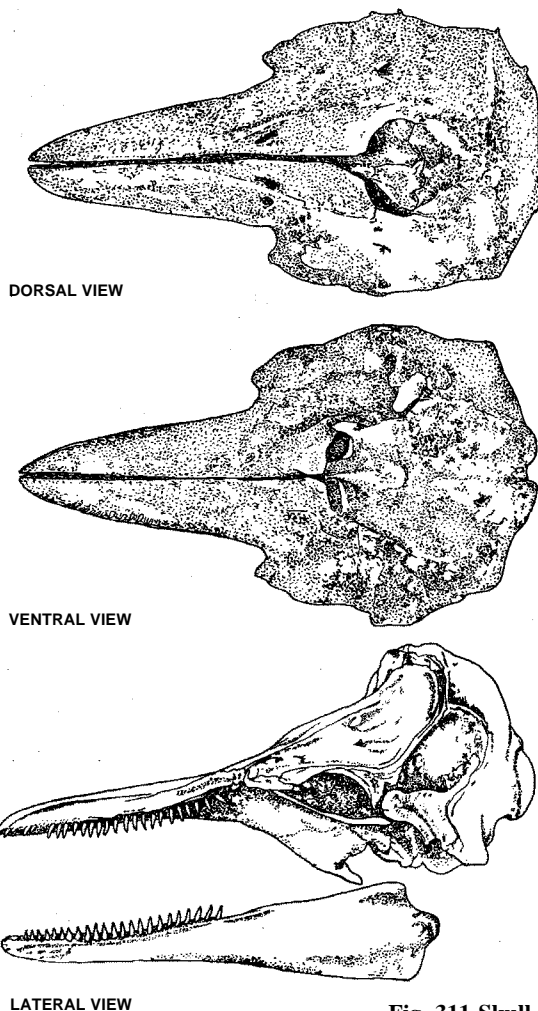


**Fig. 310 *Lagenorhynchus albirostris***

**Distinctive Characteristics:** White-beaked dolphins are extremely robust. The beak is short and thick, but set-off from the melon by a crease. The dorsal fin is tall and falcate, with a pointed tip.

The colour pattern is highly variable, but the animals are mostly black to dark grey. The beak and most of the belly are white to light grey, and the beak, especially, is often mottled. An area of light grey with an indistinct border originating on the upper flank broadens to cover most of the tail stock. There is often dark or light flecking in the region between the eye and the flipper.

Each half of each jaw is lined with 22 to 28 sharp teeth.

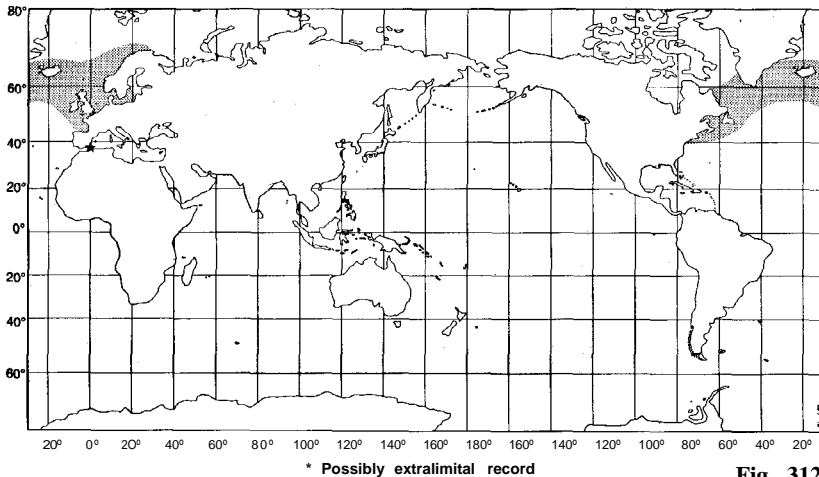


**Fig. 311 Skull**

**Can be confused with:** White-beaked dolphins are most likely to be confused with Atlantic white-sided dolphins (p. 146) from which they can be distinguished by differences in coloration and beak length. In the few areas where they overlap with bottlenose dolphins (p. 154), care must be taken to distinguish between these 2; colour-pattern differences are most useful.

**Size:** Adults are up to 3.2 m in length (males grow larger than females). Newborns are between 1.2 and 1.6 m.

**Geographical Distribution:** White-beaked dolphins inhabit cold temperate to subpolar oceanic waters of the North Atlantic, from Cape Cod and Portugal, north to central Davis Strait, central Greenland, Iceland, and northern Norway. There are also records from the western Mediterranean.



**Fig. 312**

**Biology and Behaviour:** Groups of less than 50 are most common, but herds of many hundreds have been seen. These animals are active, often leaping and breaching. While feeding they sometimes associate with large whales.

There appears to be a calving peak in summer and early autumn, but not much is known about reproduction in this species.

White-beaked dolphins feed on a variety of small schooling fishes, squid, and crustaceans.

**Exploitation:** There is a long history of hunting for white-beaked dolphins in Norway, the Faeroe Islands, Greenland, and Labrador. Hunting in some areas continues today. Incidental catches in fishing gear occur, but are not thought to be high enough to represent a threat to this species.

**IUCN Status:** Insufficiently known.

***Lagenorhynchus acutus*** (Gray, 1828)

DELPH Lag 5

DWH

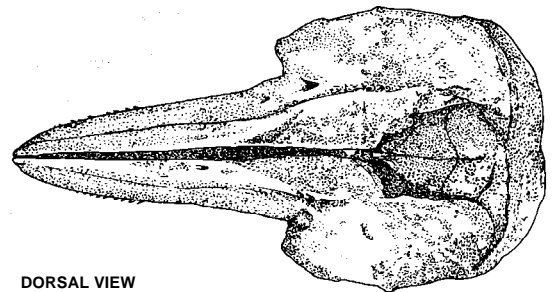
**FAO Names:** **En** - Atlantic white-sided dolphin; **Fr** - Dauphin à flancs blancs de l'Atlantique; **Sp** - Delfín de flancos blancos.

Fig. 313 *Lagenorhynchus acutus*

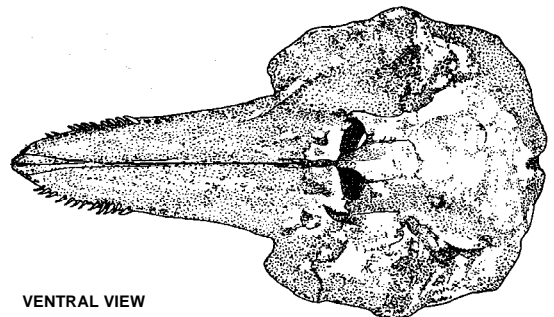
**Distinctive Characteristics:** Atlantic white-sided dolphins have the typical *Lagenorhynchus* body shape which is a stocky body with a short thick snout and tall falcate dorsal fin. The tail stock is strongly deepened.

The colour pattern is complex. The back and upper sides, upper jaw, dorsal fin, flippers, and flukes are black or dark grey, and a dark line runs backwards from the beak and surrounds the eye. The lower jaw and belly, as far as the urogenital area, are white. In between, the sides from just ahead of the eye to the base of the flukes are light grey. Along the upper margin of the grey side is a white patch from below the dorsal fin to midway along the tail stock. There is another narrow band, this one ochre in colour, at the lower margin of the dark upper flank, from the middle of the tail stock to just in front of the flukes.

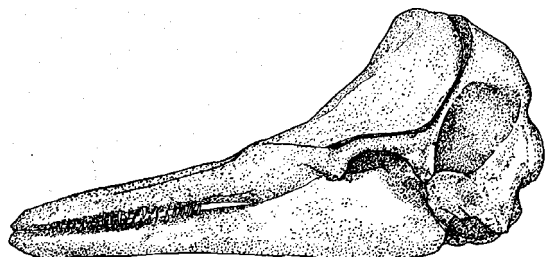
Each tooth row contains 30 to 40 pointed teeth.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 314 Skull

**Can be confused with:** Confusion is most likely with the white-beaked dolphin (p. 144), which shares a nearly identical range. The 2 can be distinguished most easily by colour-pattern differences.

**Size:** Adult Atlantic white-sided dolphins reach 2.8 m (males) or 2.5 m (females) in length and about 235 kg (males) and 182 kg (females) in weight. Newborns are 1.1 to 1.2 m.

**Geographical Distribution:** Atlantic white-sided dolphins are found in cold temperate to subpolar waters of the North Atlantic, from about New England in the west and France in the east, north to southern Greenland, Iceland, and southern Norway. They rarely enter the Baltic Sea. The preferred habitat appears to be deep waters of the outer continental shelf and slope.

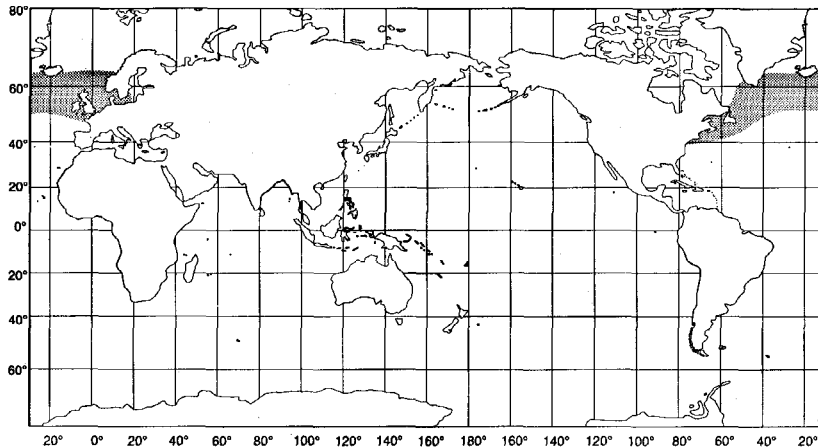


Fig. 315

**Biology and Behaviour:** Herds of up to several hundred are seen, and there is some age and sex segregation of herds. Older immature individuals are not generally found in reproductive herds of mature females and young. Atlantic white-sided dolphins are lively and acrobatic. Much of what we know of this species' biology comes from examination of individuals from mass strandings.

Calves are born in summer, with a peak in June and July.

Atlantic white-sided dolphins feed on small schooling fish and squid. They often feed in association with large whales.

**Exploitation:** Some hunting for this species occurred in the past, especially in Norway. Some are still taken in Greenland, the Faeroe Islands, and eastern Canada. Incidental kills in gillnets and other fishing gear is known from both sides of the Atlantic. Despite this exploitation, Atlantic white-sided dolphins are very abundant; at least off the northeast coast of North America.

**IUCN Status:** Insufficiently known.



***Lagenorhynchus cruciger*** (Quoy and Gaimard, 1824)

DELPH Lag 1

HRD

FAO Names: En - Hourglass dolphin; Fr - Dauphin crucigère; Sp - Delfin cruzado.

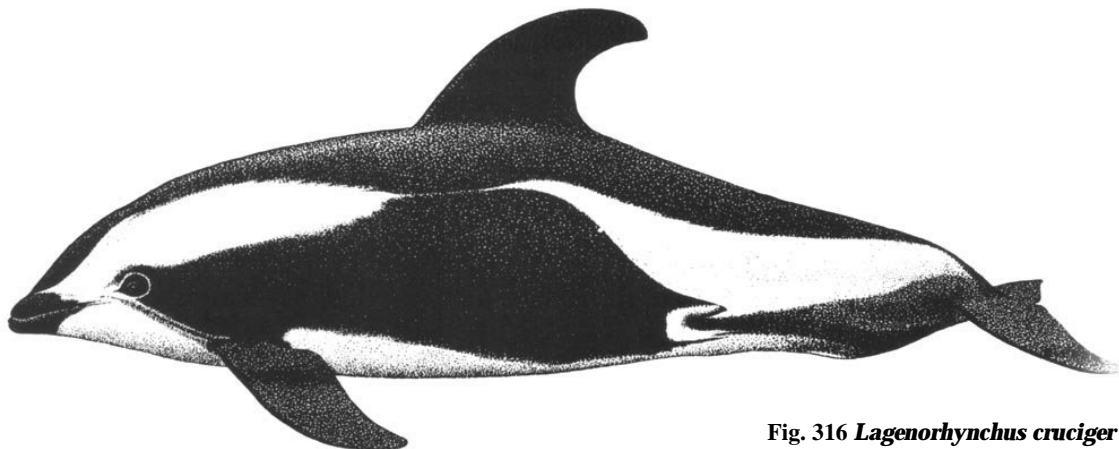
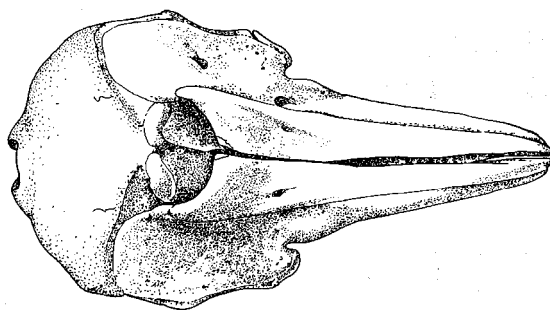


Fig. 316 *Lagenorhynchus cruciger*

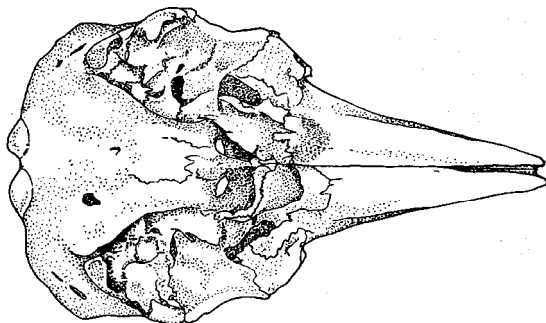
**Distinctive Characteristics:** Hourglass dolphins are robust, with extremely short and stubby (but well-defined) beaks. The moderately tall dorsal fin is set midway along the back. The markedly hooked fins seen on some individuals probably develop at the onset of physical maturity.

Hourglass dolphins are strikingly marked; black above and white below. The black sides are broken by a bold white flank patch that covers most of the tail stock in a wedge shape, tapering as it rises towards the fin. There, it meets the vertex of a white dorsal-spinal blaze that widens over the flippers, passes above the eye to cover the sides of the face and finally converges at the gape with the white of the chest and throat. These white markings resemble an hourglass in shape and give the dolphin its common name. The black rostrum is typical for the genus. The forehead and top of the head are also black. A white, hook-shaped mark curves up to the black side below the flank patch, near the genital aperture. The flippers, dorsal fin, and flukes are all black.

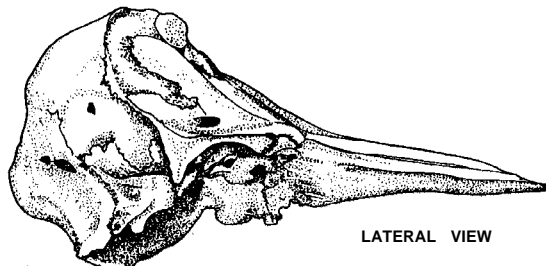
There are approximately 28 small, sharp teeth on each side of each jaw.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 317 Skull

**Can be confused with:** The hourglass dolphin has distinctive markings and is the only small oceanic dolphin with a pointed dorsal fin in subantarctic and antarctic waters; therefore, it is difficult to confuse with other species.

**Size:** Few animals have been measured; a 1.63 m male and a 1.83 m female have been reported. Length at birth is assumed to be about 1 m.

**Geographical Distribution:** Hourglass dolphins are circumpolar in the higher latitudes of the southern oceans. They range to the ice-edges in the south, but the northern limits are not known. Hourglass dolphins appear to be oceanic; however, some sightings have been made in waters of 200 m or less, near islands and banks.

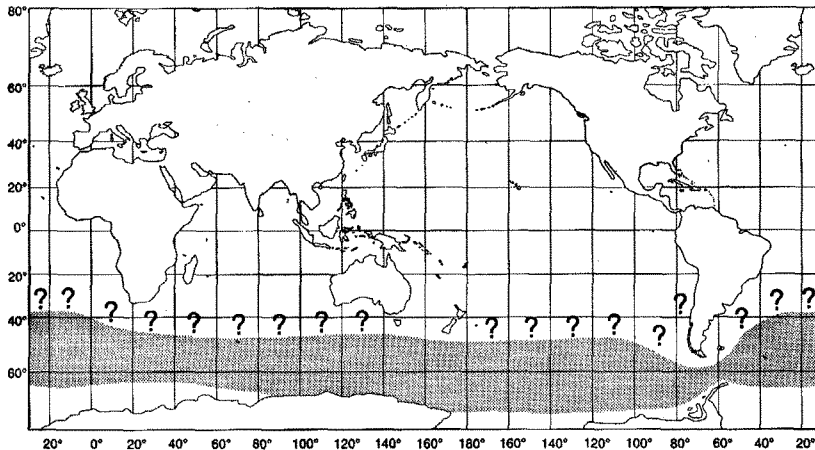


Fig. 318

**Biology and Behaviour:** Very little is known about hourglass dolphins. Groups tend to be small, which is unusual for a small oceanic delphinid. Although herds of up to 40 have been seen, groups of 1 to 6 are more common. Hourglass dolphins have been encountered with several other species of cetaceans. These dolphins are enthusiastic bowriders, often leaping as they race towards the bow or stern. They can also move rapidly without leaping, usually when avoiding a vessel; at such times they cause a highly visible "rooster tail" spray.

Almost nothing is known of the reproductive biology of this species.

The stomach contents of one hourglass dolphin contained a mass of partially digested small fish.

**Exploitation:** It may be more fair to describe the hourglass dolphin as poorly known rather than rare. It is likely that their numbers are at or near original levels. There has never been any systematic exploitation.

**IUCN Status:** Insufficiently known.

***Lagenorhynchus australis*** (Peale, 1848)

DELPH Lag 6

PLD

FAO Names: **En** - Peale's dolphin; **Fr** - Dauphin de Peale; **Sp** - Delfín austral.

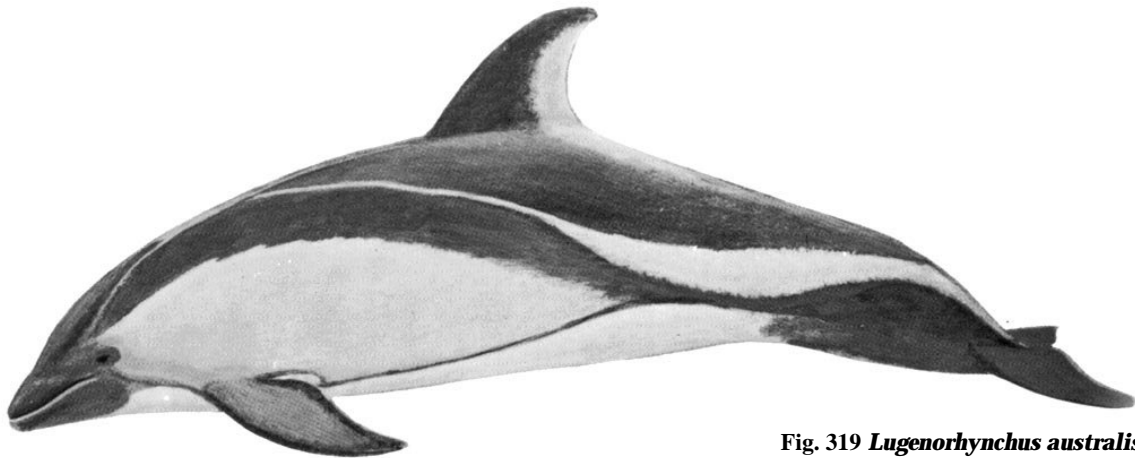
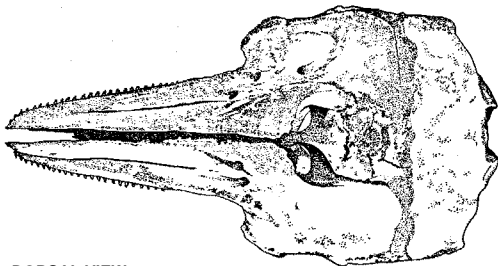


Fig. 319 *Lugenorhynchus australis*

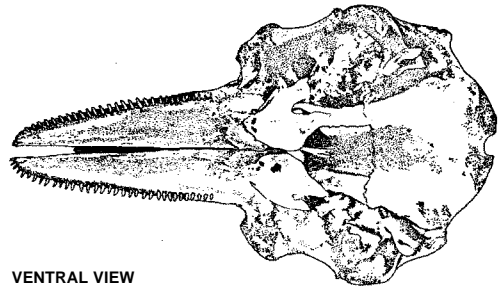
**Distinctive Characteristics:** The general body shape of Peale's dolphin is typical for dolphins of the genus *Lagenorhynchus*. Few specimens have been examined, but observations of Peale's dolphins suggest they are the most robust of the Southern Hemisphere dolphins of this genus. The dorsal fin is pointed and falcate.

Peale's dolphins share coloration pattern components with both dusky and Pacific white-sided dolphins. Peale's dolphins are greyish black above and white below. They have a curved flank patch of light grey with a single dorsal spinal blaze, or "suspender," fading into the black of the back near the blowhole. A large pale grey thoracic patch extends from the eye to midbody; it is separated from the white below by a well-developed dark stripe. The stripe loops up above a small white patch under the flipper. The flippers are grey-black, and the dorsal fin is dark grey-black, with a thin crescent of light grey on the trailing margin. Most of the beak is dark grey to black.

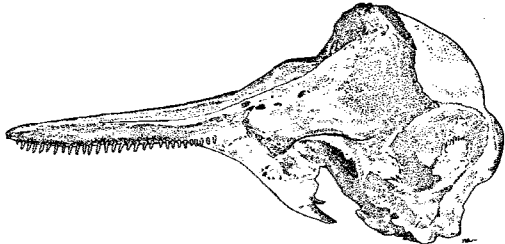
Tooth counts for 3 specimens ranged from 27 to 33 on each side of each jaw.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

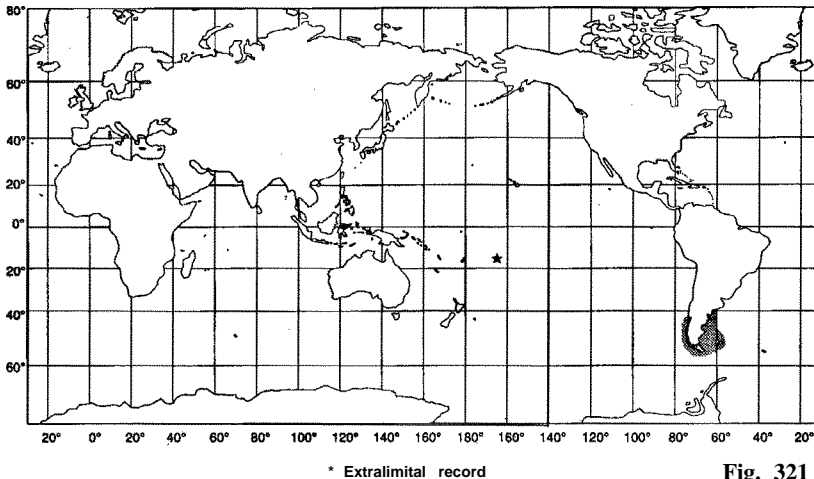


Fig. 320 Skull

**Can be confused with:** Peale's dolphins are most easily confused with dusky dolphins (p. 142). The face, rostrum, melon, and most of the chin of Peale's dolphins are dark grey-black, as if encased in a mask. This feature, plus the well-developed black stripe below the thoracic patch, readily distinguishes Peale's dolphins from dusky dolphins.

**Size:** The largest specimen recorded was 2.16 m long, and adults are estimated to weigh about 115 kg. Length at birth is estimated to be about 1 m.

**Geographical Distribution:** Peale's dolphins are coastal animals, found in bays and inlets, around islands, and over the continental shelf. They are frequently seen close to shore and sometimes shoreward of kelp beds. Peale's dolphins are confined to South America, south to about the latitudes of Valparaíso, Chile, and south central Argentina. They are regularly seen around the Falkland Islands. One exceptional sighting was reported from Palmerston Atoll.



**Fig. 321**

**Biology and Behaviour:** Peale's dolphins have been seen in small groups (5 to 30 are typical). Photoidentification studies have shown that some dolphins spend the entire year in limited areas close to shore, in the Magellan Strait. They frequently bowride, and will sprint to a ship's bow. At the bow, they often speed ahead, leap high into the air and fall back into the water on their sides, producing a large splash with a loud slapping noise.

Newborns have been observed in Magellan Strait as early as October.

Little is known of food and feeding habits; one animal collected in the Falkland Islands had recently consumed an octopus and others have been observed feeding on róbalo (snooks, family Centropomidae) and pejerrey (silversides, family Atherinidae).

**Exploitation:** Peale's dolphins are incidentally entangled and drowned in nets; also, they are intentionally harpooned in the Strait of Magellan and around Tierra del Fuego. The number harpooned, for use as bait in crab traps, may pose a serious threat to their status. A population estimate does not exist.

**IUCN Status:** Insufficiently known.

*Grampus griseus* (Cuvier, 1812)

DELPH Gram 1

DRR

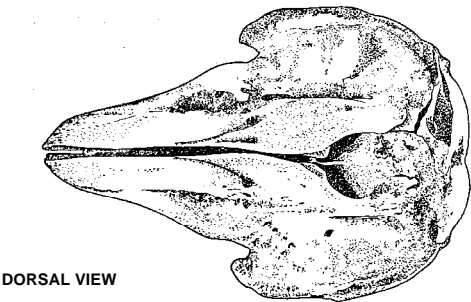
FAO Names: En - Risso's dolphin; Fr - Grampus; Sp - Delfín de Risso.



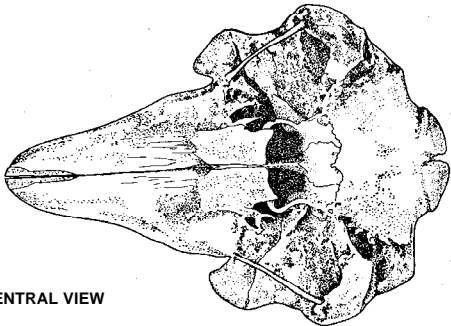
Fig. 322 *Grampus griseus*

**Distinctive Characteristics:** Risso's dolphins are robust blunt-headed animals without distinct beaks. The flippers are long, pointed, and recurved; the dorsal fin is tall and falcate. Risso's dolphins have mouthlines that slope upward. One of the most distinctive features is a vertical crease on the front of the melon. However, at sea, the best identification character is the coloration and scarring. Adults range from dark grey to nearly white, but are typically covered with white scratches, spots, and blotches. The chest has a whitish anchor-shaped patch, and the appendages tend to be darker than the rest of the body. Young animals range from light grey to dark brownish grey and are relatively unmarked.

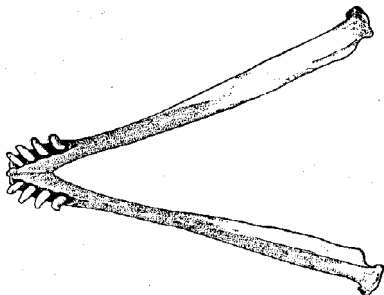
The teeth are also unique; there are 2 to 7 pairs in the front of the lower jaw and usually none in the upper jaw. Some or all of the teeth may be worn-down in, or missing from, adults.



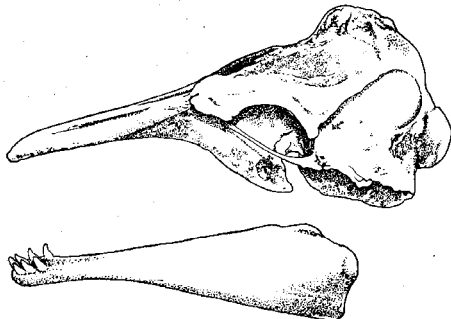
DORSAL VIEW



VENTRAL VIEW



DORSAL VIEW OF MANDIBLE



LATERAL VIEW

Fig. 323 Skull

**Can be confused with:** Risso's dolphins are generally easy to identify when seen at close range; however, from a distance they may be confused with other large delphinids with a tall dorsal fin (such as bottlenose dolphins [p.154], false killer whales [p. 126], and killer whales [p. 120]). When visible, the light, extensively scarred bodies and squarish heads of Risso's dolphins make them unmistakable.

**Size:** Newborns are 1.2 to 1.5 m long and adults range up to at least 3.8 m long. Weights of up to 400 kg have been recorded, and the maximum may be near 500 kg.

**Geographical Distribution:** This is a widely distributed species, inhabiting deep oceanic and continental slope waters from the tropics through the temperate regions in both hemispheres. They are found from Newfoundland, Norway, the Kamchatka Peninsula, and Gulf of Alaska in the north to the tips of South America and South Africa, southern Australia, and southern New Zealand in the south.

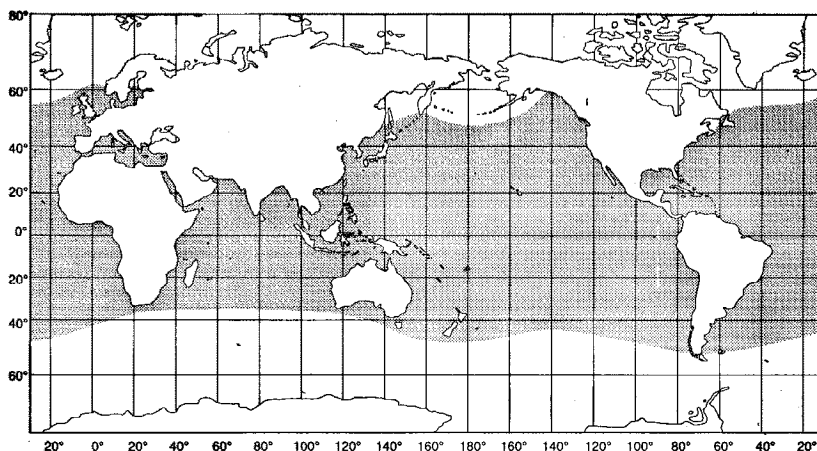


Fig. 324

**Biology and Behaviour:** These large dolphins are often seen surfacing slowly, although they can be energetic, sometimes breaching or porpoising, and occasionally bowriding. Herds tend to be small to moderate in size, but groups of up to 4 000 have been reported. Risso's dolphins commonly associate with other species of cetaceans. Hybrids between this species and the bottlenose dolphin have been recorded, both in captivity and in the wild.

In the North Atlantic, there appears to be a summer calving peak.

Risso's dolphins feed on crustaceans and cephalopods, but seem to prefer squid. Squid bites may be the cause of some of the scars found on the bodies of these animals.

**Exploitation:** Risso's dolphins have been taken in small numbers, (both incidentally and intentionally) in drive, gillnet, seine, and harpoon fisheries throughout the species' range. In Sri Lanka, they are apparently the second most commonly taken cetacean in fisheries, providing fish and meat for human consumption and fish bait; stocks there may be adversely affected.

**IUCN Status:** Insufficiently known.

***Tursiops truncatus*** (Montagu, 1821)

DELPH Tur 1

DBO

FAO Names: En - Bottlenose dolphin; Fr - Grand dauphin; Sp - Tursion.



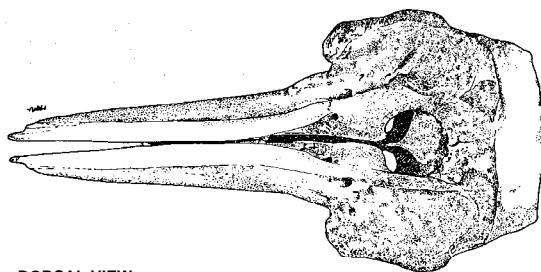
Fig. 325 *Tursiops truncatus*

**Distinctive Characteristics:** The bottlenose dolphin is probably the most familiar of the small cetaceans because of its coastal habits, prevalence in captivity worldwide, and frequent appearance on television and in advertising. It is a large, relatively robust dolphin, with a short to moderate-length stocky snout that is distinctly set off from the melon by a crease. The dorsal fin is tall and falcate, and set near the middle of the back.

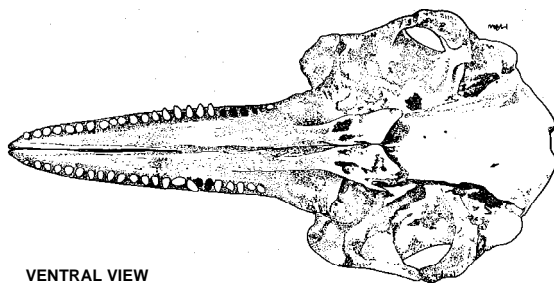
Colour varies from light grey to nearly black on the back and sides, fading to white (sometimes with a pinkish hue) on the belly. The belly and lower sides are sometimes spotted. There is a dark stripe from eye to flipper, and a faint dorsal cape on the back (and sometimes an indistinct spinal blaze), generally only visible at close range. Often, there are brushings of grey on the body, especially on the face, and from the apex of the melon to the blowhole.

Bottlenose dolphins have 18 to 26 pairs of robust teeth in each jaw. In older animals, many of these may be worn down or missing.

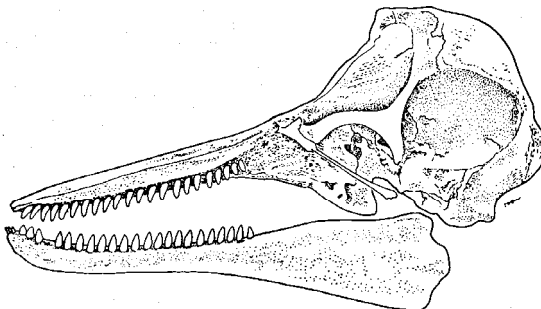
In many areas of the world, such as South Africa, the Northwest Atlantic, Peru, and the eastern North Pacific, there appear to be 2 forms, a coastal type and an offshore type; however, the taxonomy of bottlenose dolphins is still somewhat confused, due to the great extent of geographical variation.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW WITH MANDIBLE

Fig. 326 Skull

**Can be confused with:** Bottlenose dolphins can be mistaken for several other species of dolphins, depending on the area. There can be confusion in the tropical Atlantic with Atlantic spotted dolphins (p. 158), along the east coast of South America with dolphins of the genus *Sotalia* (p. 132), and in the Indo-Pacific and off West Africa with hump-backed dolphins (starting on p. 134). When seen from a distance, they could also be confused with Risso's (p. 152) or rough-toothed (p. 138) dolphins. Such confusion will generally only occur when the animals are not seen well; in most situations, bottlenose dolphins are distinctive.

**Size:** Adults range from 1.9 to 3.8 m, with males somewhat larger than females. There is incredible variation between different populations. Maximum weight is at least 650 kg, although most animals are much smaller. Length at birth is about 1 to 1.3 m.

**Geographical Distribution:** Bottlenose dolphins are found primarily in coastal and inshore regions of tropical and temperate waters of the world. Population density appears to be higher nearshore. Bottlenose dolphins are known also to inhabit some pelagic waters, such as those in the eastern tropical Pacific. Except for their occurrence around the United Kingdom and northern Europe, they generally do not range poleward of 45° in either hemisphere.

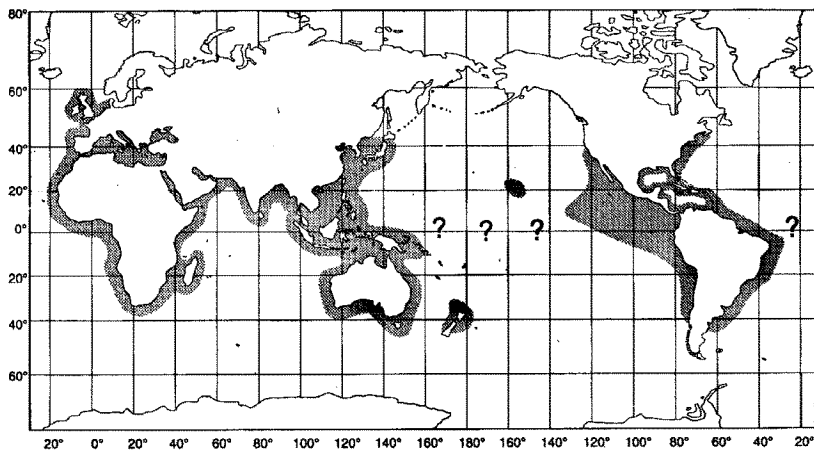


Fig. 327

**Biology and Behaviour:** More is known of the biology of this species than of any other dolphin. Group size is commonly less than 20, but large herds of several hundred are often seen offshore. Bottlenose dolphins are commonly associated with other cetaceans, and hybrids with other species are known from both captivity and in the wild. Based on a number of studies of nearshore populations, bottlenose dolphins seem to live in relatively open societies. In some areas, dolphins have limited home ranges; in others, they are migratory, generally ranging further. Mother and calf bonds and some other associations may be strong, but individuals may be seen from day-to-day with a variety of different associates. The bottlenose dolphin is the most common species of dolphin held in captivity. It has proven highly adaptable and is easily trained. Much of what we know of the general biology of dolphins comes from studies of bottlenose dolphins, both in captivity and in the wild. Bottlenose dolphins are sometimes active (especially when feeding or socializing), often slapping the water with their flukes, leaping, and performing other aerial behaviours. Spring and summer or spring and autumn calving peaks are known for most populations. They are opportunistic feeders, apparently taking whatever suitable prey is most abundant at the time. Feeding behaviour is varied, ranging from cooperative foraging on schooling fish, to individually chasing fish onto mudbanks, to feeding behind shrimp trawlers and other fishing operations.

**Exploitation:** Both incidental and direct exploitation of bottlenose dolphins are known to occur, generally at low to moderate levels. The largest direct kills have traditionally been in the Black Sea, where Russian and Turkish hunters apparently have reduced local populations. Bottlenose dolphins also are taken elsewhere in gillnets, shark nets, shrimp trawls, and purse seines (the latter in the multi-national tuna purse seine fishery of the eastern tropical Pacific). They also are occasional victims of harpoon and drive fisheries. Live capture removals have had considerable effects on some populations, such as those in the Gulf of Mexico and U.S. southeast coast.

**IUCN Status:** Insufficiently known.



***Stenella attenuata*** (Gray, 1846)

DELPH Sten 3

DPN

**FAO Names:** **En** - Pantropical spotted dolphin; **Fr** - Dauphin tacheté de pantropical; **Sp** - Estenela moteada.



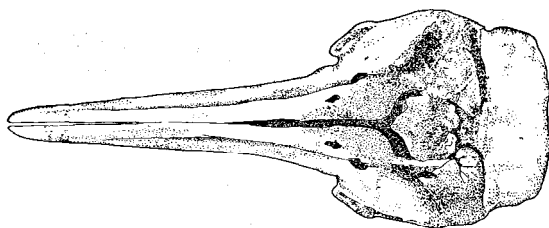
**Fig. 328 *Stenella attenuata***

**Distinctive Characteristics:** Pantropical spotted dolphins (sometimes called “spotters”) are generally slender, streamlined animals. They have a long thin beak that is separated from the melon by a distinct crease. The dorsal fin is narrow, falcate, and usually pointed at the tip.

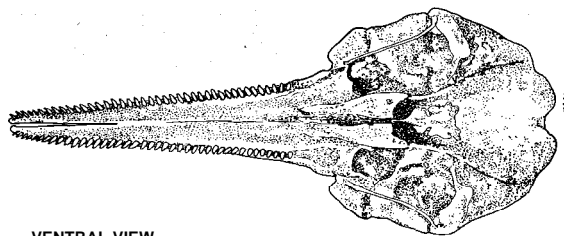
Although unspotted at birth, by adulthood Pantropical spotted dolphins have varying degrees of white mottling on the dark dorsal cape, which is narrow on the head and sweeps low on the flank in front of the dorsal fin. The spotting ranges from very slight (or even non-existent) in offshore animals to heavy enough to obliterate the cape in coastal dolphins. The lower sides and belly of adults are grey and the lips and beak tip tend to be brilliant white. A dark grey band encircles the eye, and continues forward to the apex of the melon; there also is a dark gape-to-flipper stripe.

In each tooth row are 34 to 48 slender, sharply pointed teeth.

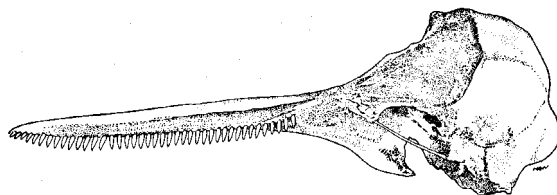
In at least the eastern tropical Pacific, a separate coastal form exists. It is larger and stockier, with a thicker beak and more extensive spotting than the offshore form.



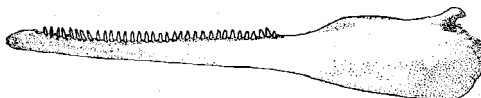
**DORSAL VIEW**



**VENTRAL VIEW**



**LATERAL VIEW**

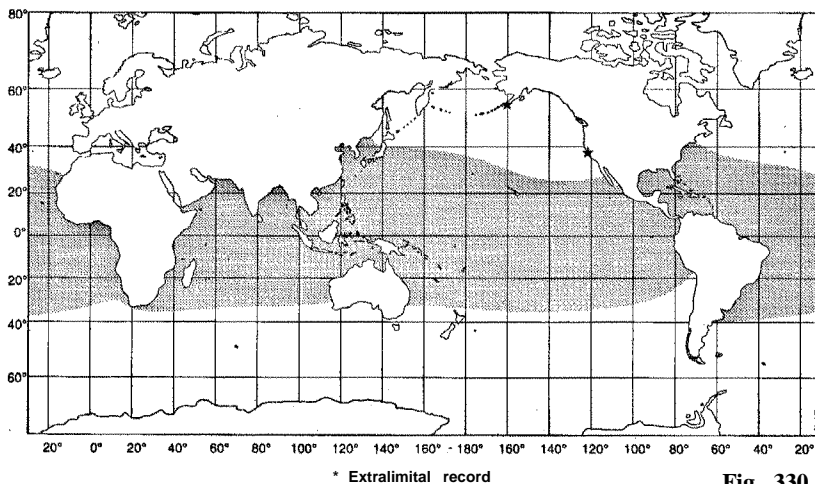


**Fig. 329 Skull**

**Can be confused with:** Pantropical spotted dolphins can be confused with several other long-beaked oceanic dolphins. Spinner dolphins (p. 160) can be distinguished by differences in dorsal-fin shape, beak length, and colour pattern. In addition to Atlantic spotted dolphins (p. 158) both bottlenose (p. 154) and hump-backed (starting on p. 134) dolphins can also be spotted (generally on the belly), but will often be distinguishable by differences in body shape and size.

**Size:** Adults are from 1.6 to 2.4 m (females) or 1.6 to 2.6 m (males). Animals from offshore populations can weigh up to at least 120 kg, but are smaller than those from coastal ones. At birth, pantropical spotted dolphins are about 85 cm long.

**Geographical Distribution:** Pantropical spotted dolphins are mostly creatures of oceanic tropical zones. As their name implies, these animals are found in all oceans, between about 40°N and 40°S, although they are much more abundant in the lower latitude portions of their range.



**Fig. 330**

**Biology and Behaviour:** These animals are among the most abundant dolphins in the eastern tropical Pacific and are the primary species involved in interactions with tuna there. Pantropical spotted dolphins associate with yellowfin tuna, spinner dolphins, and other pelagic predators; the fishermen take advantage of this association to help them locate and catch tuna more efficiently.

School sizes are generally less than 100 for the coastal form, but offshore herds may number in the thousands. In the eastern tropical Pacific, large herds are less common than they were before the tuna fishery began to exploit them. These gregarious animals are fast swimmers, often engaging in acrobatics, and frequently bowriding (except on the tuna fishing grounds of the eastern tropical Pacific, where they generally have learned to avoid boats).

There are 2 calving peaks in the eastern tropical Pacific, 1 in spring and 1 in autumn.

Pantropical spotted dolphins feed largely on epipelagic fish and squid, primarily during the day.

**Exploitation:** The tuna fishery in the eastern tropical Pacific targets the pantropical spotted dolphin to catch yellowfin and skipjack tuna that often swim below the herds. Annual mortality of spotted dolphins in the late 1980s was in the tens of thousands. Takes of hundreds of thousands per year in the 1960s and 1970s reduced the northern offshore stock of spotters to an unknown degree. Spotted dolphins are also taken in other fisheries, including drive fisheries in Japan and the Solomon Islands, and Sri Lankan gillnet and harpoon fisheries for human consumption, among others. Some have been reported taken in the Caribbean small cetacean fishery.

**IUCN Status:** Insufficiently known.

***Stenella frontalis*** (Cuvier, 1829)

DELPH Sten 2

DST

**FAO Names:** En - Atlantic spotted dolphin; Fr - Dauphin tacheté l'Atlantique; Sp - Delfín pintado.

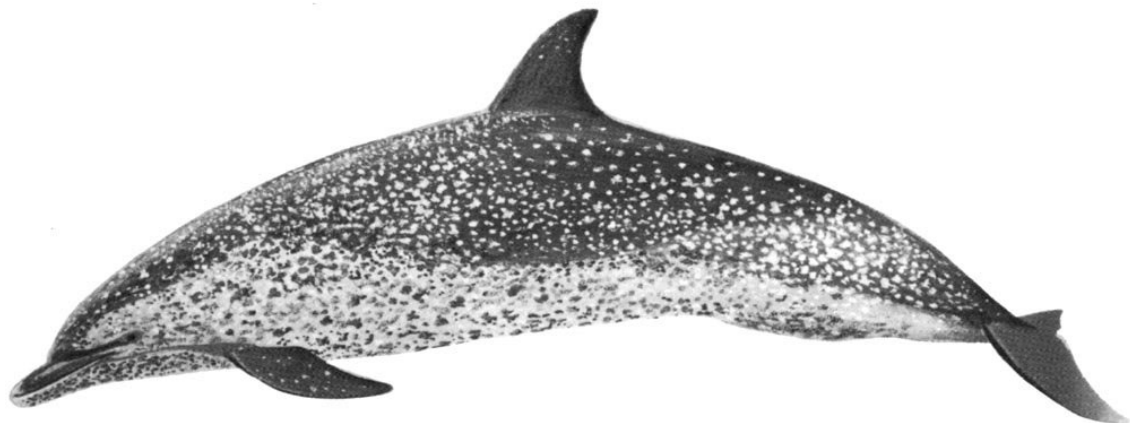
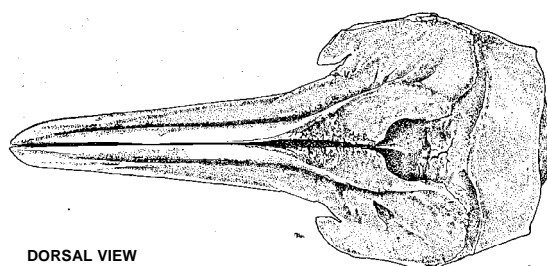


Fig. 331 *Stenella frontalis*

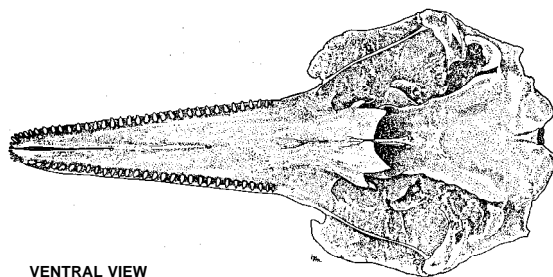
**Distinctive Characteristics:** The Atlantic spotted dolphin, in many ways, tends to resemble the bottlenose dolphin more than it does the pantropical spotted dolphin. In body shape, it is somewhat intermediate between the 2, with a moderately long, but rather chunky, beak. There is a distinct crease between the melon and beak.

There is much developmental variation in the colour pattern. Atlantic spotted dolphins begin life with unspotted background coloration. Young animals look much like slender bottlenose dolphins, with a dark cape, light grey sides and spinal blaze (variable in its development), and white belly. Large spotting on both dorsal and ventral surfaces progresses as the animal ages: some individuals become so heavily spotted that the cape margin and spinal blaze are obscured. However, in some populations, adults are essentially unspotted (these are generally in offshore areas).

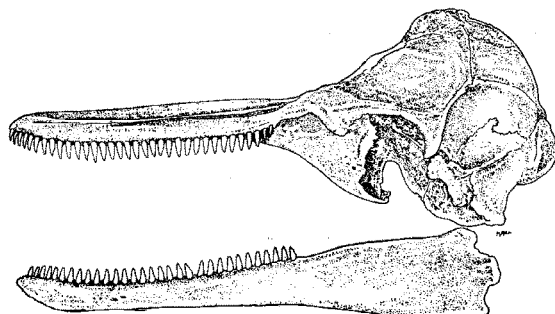
There are 30 to 42 pointed teeth in each tooth row.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 332 Skull

**Can be confused with:** Atlantic spotted dolphins can be most easily confused with bottlenose dolphins (p. 154) and sometimes with pantropical spotted dolphins (p. 156). The differences in size and robustness are good clues, but may require a trained eye to distinguish in many sightings at sea. Heavy spotting is a good characteristic for Atlantic spotted dolphins; however, some may be nearly unspotted and some bottlenose dolphins may have spotting and blotches on the belly and sides. Pantropical spotted dolphins (p. 156) also may be difficult to distinguish, but attention to body robustness, snout shape, and colour pattern differences will allow them to be separated. Only the coastal form of the pantropical spotted dolphin is likely to appear very similar to the Atlantic spotted dolphin, but the former is only known from the eastern Pacific.

**Size:** Adults are up to 2.3 m long and 143 kg in weight. Newborn Atlantic spotted dolphins are 0.8 to 1.2 m long.

**Geographical Distribution:** This species is found only in the Atlantic Ocean, from southern Brazil to New England in the west, and to the coast of Africa in the east (the exact limits off West Africa are not well known).

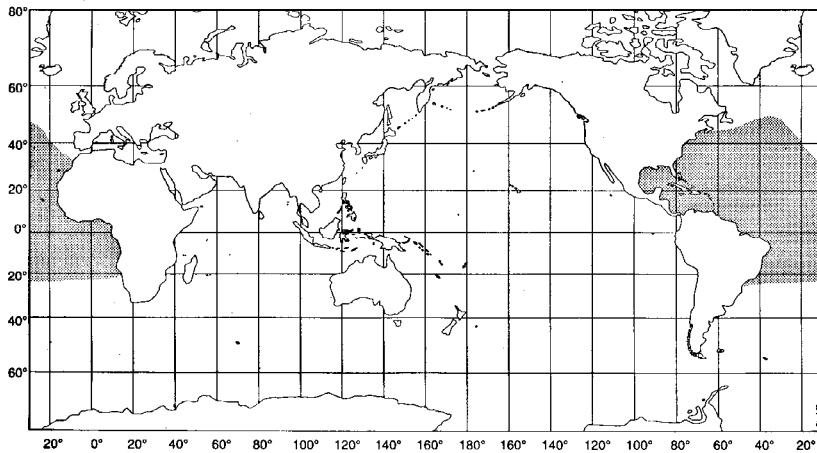


Fig. 333

Their tropical to warm temperate distribution is mostly over the offshore continental shelf, but Atlantic spotted dolphins also inhabit some deep oceanic waters.

**Biology and Behaviour:** Small to moderate groups, generally of less than 50 individuals, are characteristic of the Atlantic spotted dolphin. Coastal groups usually consist of 5 to 15 animals. These are acrobatic animals and they are known to be avid bowriders. Studies of Atlantic spotted dolphins off the Bahamas that allow people to swim with them show that these animals have a fluid group structure, like that of bottlenose and other small dolphins.

There is not much known of the species' life history, but tropical populations would be expected to have a protracted breeding season.

A wide variety of fishes and squids are taken by this species.

**Exploitation:** Atlantic spotted dolphins are taken in a direct fishery for small cetaceans in the Caribbean. Direct takes may also occur off the Azores and off West Africa. Some are probably also taken incidentally in tuna purse seines off the West African coast. However, there are not reliable estimates of the number of animals taken in any of these fisheries.

**IUCN Status:** Insufficiently known.

***Stenella longirostris*** (Gray, 1828)

DELPH Sten 4

DSI

**FAO Names:** En - Spinner dolphin; Fr - Dauphin longirostre; Sp - Estenela giradora.

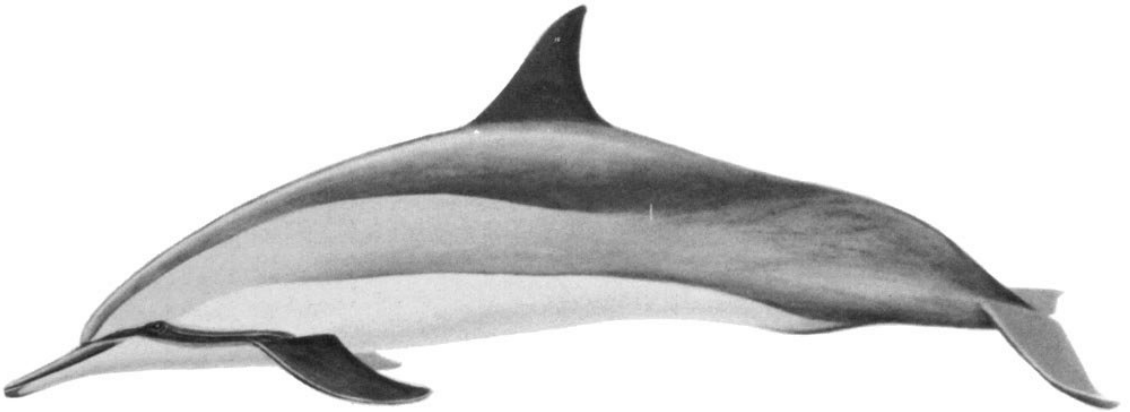
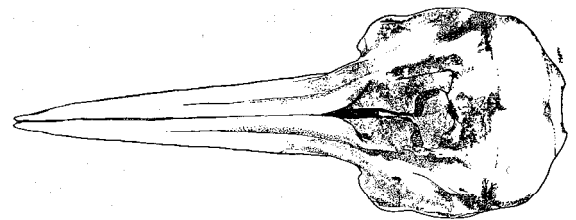


Fig. 334 *Stenella longirostris*

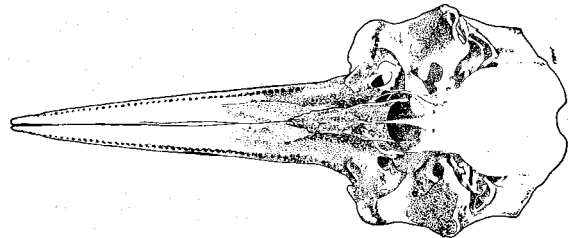
**Distinctive Characteristics:** The spinner dolphin is a slender dolphin, with an extremely long, thin beak. Also, the head is very slender at the apex of the melon. The dorsal fin ranges from slightly falcate to erect and triangular. In adult males of some stocks, the dorsal fin may become so canted forward that it looks as if it were stuck on backwards, and the tail stock may become very deepened, with an enlarged post-anal keel of connective tissue.

Spinner dolphins generally have dark eye-to-flipper stripes and dark lips and beak tips. There are 3 subspecies known. The individuals of most spinner dolphin stocks in the world have a three-part colour pattern (dark grey cape, light grey sides, and white belly) and only minor differences in appearance of males and females. These animals (illustrated above) are called Gray's spinner dolphins (*S. l. longirostris*).

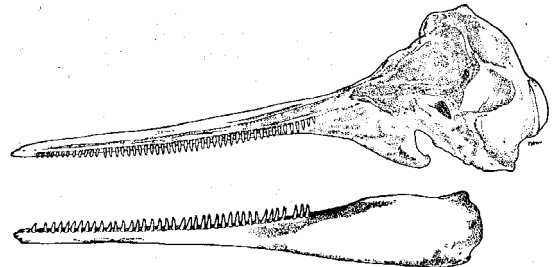
In the eastern tropical Pacific, there are 3 other forms. Eastern spinner dolphins (*S. l. orientalis*) have a monotone steel grey colour pattern, with white only as patches around the genitals and axillae. They have the most exaggerated sexual dimorphism. Central American spinner dolphins (*S. l. centroamericana*), previously called Costa Rican spinners, are poorly known, but appear to have a similar colour pattern, although it may lack the white ventral patches. A third type of spinner dolphin in the eastern tropical Pacific, often called the whitebelly spinner dolphin, appears to represent a hybrid between eastern spinner and Gray's spinner dolphins. Whitebelly spinners are more robust, with a two-part colour pattern and less exaggerated sexual dimorphism than the other stocks in the eastern tropical Pacific.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 335 Skull

Geographical forms of spinner dolphins have not been well described for most areas, with the exception of the eastern Pacific; although a dwarf form has been described from the Gulf of Thailand. Animals of the above described forms, or other undescribed stocks, may exist elsewhere as well.

In spinner dolphins, there are 45 to 62 pairs of very fine, pointed teeth in each jaw. This is more than in almost any other cetacean species.

**Can be confused with:** From a distance, other long-snouted oceanic dolphins can look like spinner dolphins. Spinner dolphins are most likely to be confused with clymene dolphins (p. 162) in the Atlantic, but careful attention to colour pattern differences and head and body shape differences will allow them to be distinguished.

**Size:** Newborn spinner dolphins are about 75 to 80 cm long; adults reach 2 m (females) and 2.4 m (males). They reach weights of at least 77 kg. Eastern spinner dolphins are the smaller and Central American spinner dolphins the larger of the subspecies in the eastern tropical Pacific.

**Geographical Distribution:** The range of the spinner dolphin is nearly identical to that of the pantropical spotted dolphin, encompassing oceanic tropical and subtropical zones in both hemispheres. Limits are near 40°N and 40°S.

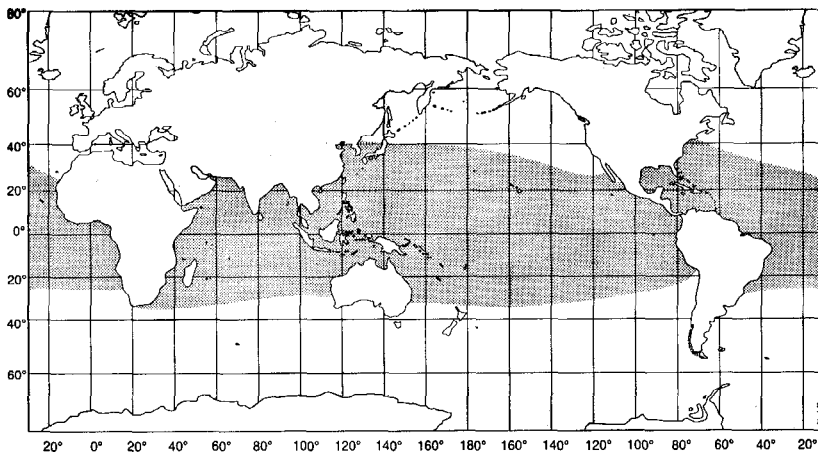


Fig. 336

**Biology and Behaviour:** The spinner dolphin is named for its habit of leaping from the water and spinning up to 7 times on its long axis, before falling back to the water. This is one of the most aerial of all dolphins. Herd sizes range from less than 50 up to several thousand. Associations with pantropical spotted dolphins are common in the eastern tropical Pacific.

Calving peaks in different populations range from late spring to autumn.

Spinner dolphins of most populations feed predominantly at night, on mid-water fish and squid, and rest during much of the day. Their association with pantropical spotted dolphins and yellowfin tuna results in their entanglement in tuna purse seines in the eastern tropical Pacific.

**Exploitation:** Both the whitebelly and eastern spinner forms have been heavily involved in the tropical Pacific tuna purse seine fishery. The numbers of eastern spinners have been reduced significantly in the last few decades by this fishing practice. Catches of spinner dolphins also occur in the Caribbean, Australia, Japan, Thailand, the Philippines, and Sri Lanka; in this last area up to 15 000 are killed each year in gillnets and by hand-harpooning. There are likely to be fisheries interactions off West Africa.

**IUCN Status:** Insufficiently known.

*Stenella clymene* (Gray, 1850)

DELPH Sten 5

DCL

**FAO Names:** En - Clymene dolphin; Fr - Dauphin de Clyméné; Sp - Delfín clymene.

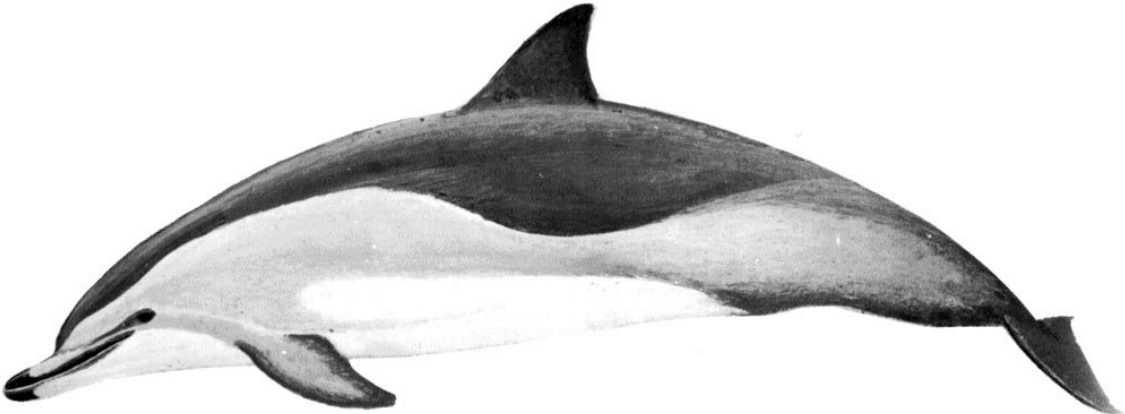
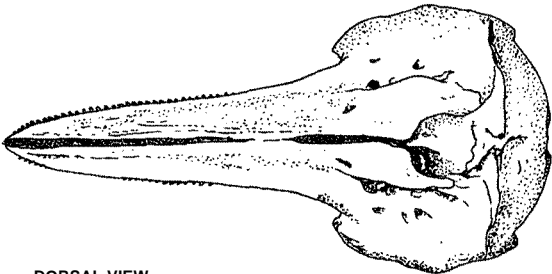


Fig. 337 *Stenella clymene*

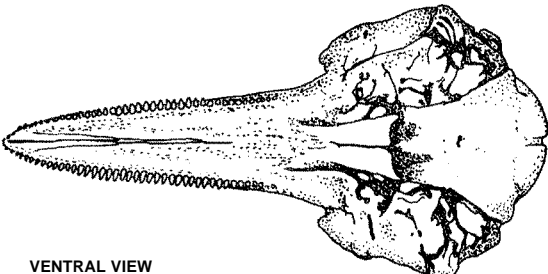
**Distinctive Characteristics:** The clymene dolphin is externally similar to the spinner dolphin, but is smaller and more robust, with a much shorter and stockier beak. The dorsal fin is slightly more falcate, as opposed to the often very triangular dorsal fins of spinner dolphins. Despite these external similarities with the spinner dolphin, skull morphology indicates that the clymene dolphin may be closely related to the striped dolphin.

A three-part colour pattern, with a dark grey cape, light grey sides, and white belly, is characteristic of this species. The cape dips in 2 places, above the eye, and below the dorsal fin. The beak is mostly light grey, but the lips and beak tip are black. There is also a dark stripe on the top of the beak, from the tip to the apex of the melon, and often a dark “moustache” marking on the middle of the top of the beak. The eye is also surrounded by black, and a dark grey stripe runs from the eye to the flipper.

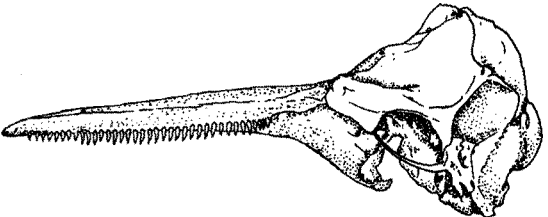
Tooth counts are generally much lower than in spinner dolphins: 38 to 49 teeth per row. They are slender and pointed.



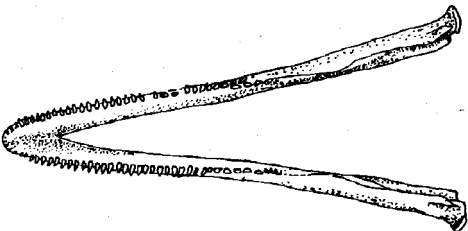
DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW



DORSAL VIEW OF MANDIBLE

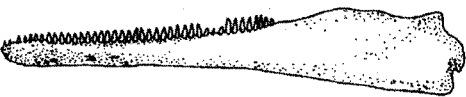


Fig. 338 Skull

**Can be confused with:** Clymene dolphins are most easily confused with spinner dolphins (p. 160), but are more robust, with shorter stubbier beaks. Also, the colour pattern is slightly different; the 2 dips in the cape and the dark line (and often a "moustache") on top of the beak will allow clymene dolphins to be distinguished. The body shape of clymene dolphins also closely resembles that of short-beaked (offshore) forms of the common dolphin (p. 166), as does the colour pattern in a superficial way. Common dolphins can best be distinguished by their hourglass pattern, cape that forms a V below the dorsal fin, chin-to-flipper stripe, and absence of a "moustache."

**Size:** So far, clymene dolphins are known to reach at least 2.0 m in length and sexual maturity is reached by about 1.8 m. Newborn length is unknown, but is less than 1.2 m. This species reaches weights of at least 85 kg.

**Geographical Distribution:** The clymene dolphin is found only in the tropical and subtropical Atlantic Ocean, including the Caribbean Sea and Gulf of Mexico. There are records as far north as New Jersey on the U.S. east coast and as far south as southern Brazil. The limits on the West African coast are not well known. This is a deep water oceanic species, not normally seen near shore.

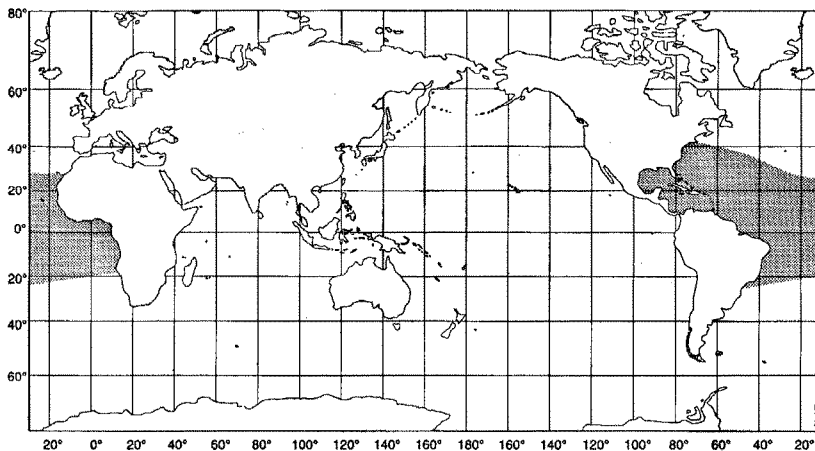


Fig. 339

**Biology and Behaviour:** Very little is known of the clymene dolphin's natural history. Schools tend to be much smaller than those of spinner dolphins (generally less than 50 animals). They are known to associate with other species of dolphins. These quick and agile dolphins ride bow waves, and have been reported to spin on the long axis.

Clymene dolphins feed on small fish and squid at moderate depths, presumably mainly at night.

**Exploitation:** In the Caribbean, clymene dolphins appear, at least occasionally, to be taken in the Lesser Antilles small cetacean fishery, and in gillnets. They may be one of the species taken in tuna purse seines in the eastern tropical Atlantic.

**IUCN Status:** Insufficiently known.



***Stenella coeruleoalba*** (Meyen, 1833)

DELPH Sten 1

DST

FAO Names: En - Striped dolphin; Fr - Dauphin bleu et blanc; Sp - Estenela listada.

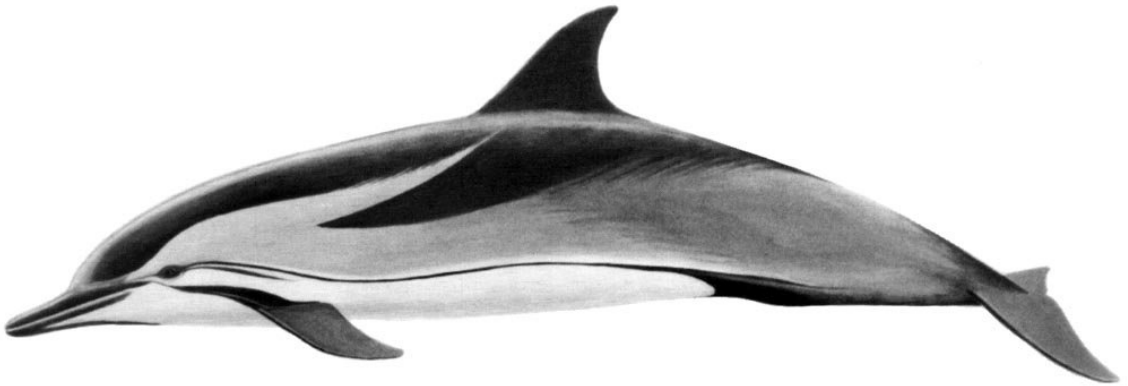
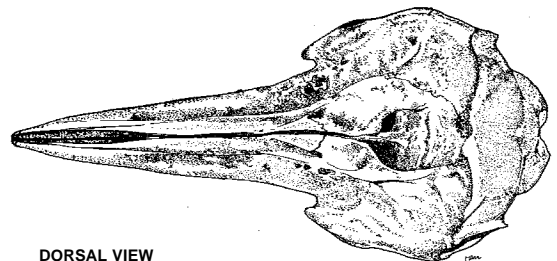


Fig. 340 *Stenella coeruleoalba*

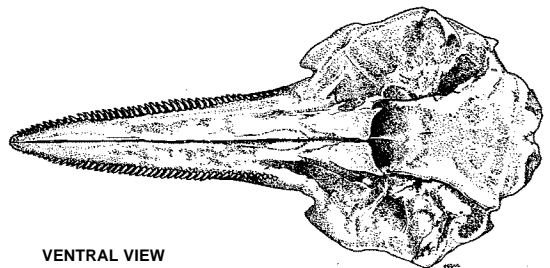
**Distinctive Characteristics:** The striped dolphin has the body shape typical of the *Stenella* and *Delphinus* species and it is somewhat more robust than spinner and pantropical spotted dolphins, with a falcate dorsal fin and a moderately long beak.

The colour pattern is stunning: a white or pinkish belly and dark grey back are separated by a light grey flank. A variable light grey spinal blaze extends from the flank area to just under the dorsal fin. The black beak sends back a stripe which encircles the eye and then widens and runs back to the anus. There is an eye to flipper stripe and an accessory stripe between the other 2. The appendages are dark grey to black.

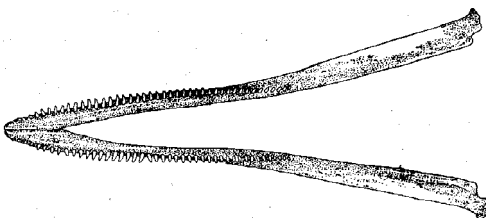
The mouth contains 40 to 55 small, sharp teeth in each tooth row.



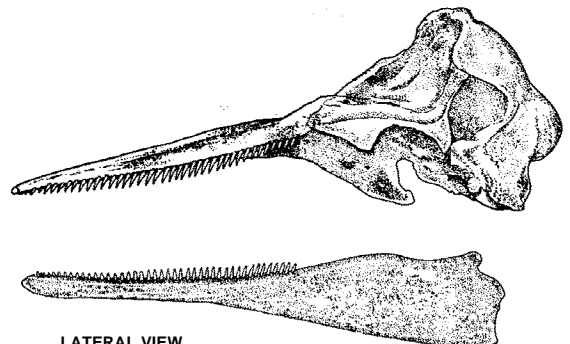
DORSAL VIEW



VENTRAL VIEW



DORSAL VIEW OF MANDIBLE



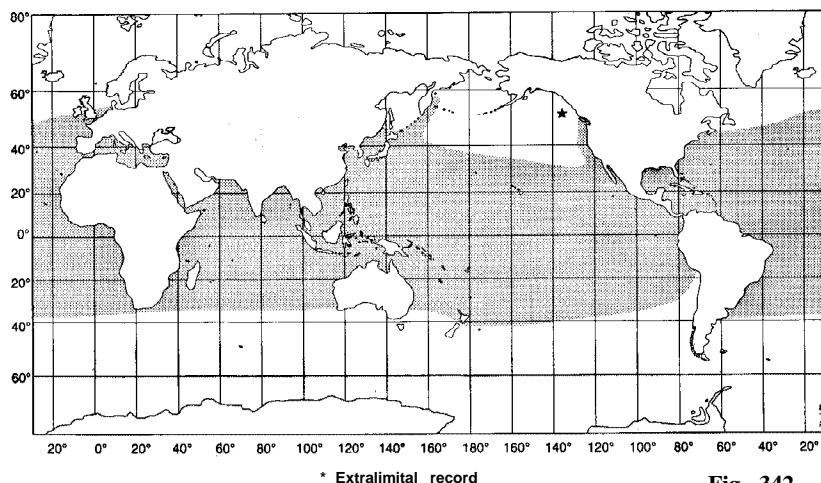
LATERAL VIEW

Fig. 341 Skull

**Can be confused with:** Although the body shape is similar to that of other species in the *Stenella* and *Delphinus* group, striped dolphins are generally easy to distinguish by their unique colour patterns. Fraser's dolphins (p 168) also have an eye-to-anus stripe, but are much more robust, with tiny appendages.

**Size:** Adult striped dolphins are up to 2.6 m long; males are slightly larger than females. Maximum weight is about 156 kg. Newborns are about 1 m in length.

**Geographical Distribution:** Although also primarily a warm water species, the range of the striped dolphin extends higher into temperate regions than do those of its closest relatives, the spotted and spinner dolphins. Limits are about 50°N and 40°S. Striped dolphins also are generally restricted to oceanic regions, and are seen close to shore only where deep water approaches the coast.



**Fig. 342**

**Biology and Behaviour:** Striped dolphins are fast swimmers, and tend to be more easily alarmed than other tropical dolphins; this and their colour pattern have prompted fishermen to call them “streakers.” Although most herds number between 100 and 500 individuals, striped dolphins sometimes assemble into herds of thousands. Off Japan, there appears to be some age and sex segregation of these large herds.

Off Japan, where the biology of this species has been best studied, there are 2 calving peaks: 1 in summer, another in winter.

The diet of this species consists primarily of small, mid-water squid and fish, especially lanternfish.

**Exploitation:** Striped dolphins are taken in the tuna purse seine fishery in the eastern tropical Pacific, although in much smaller numbers than are spotted, spinner, and common dolphins. This species is the major target of a large drive fishery off Japan, where several thousand are taken each year. They are also caught in the small cetacean fishery of Sri Lanka, in the Indian Ocean. There appears to be some direct capture of striped dolphins in the northeast Atlantic and Mediterranean Sea.

**IUCN Status:** Insufficiently known.

***Delphinus delphis*** Linnaeus, 1758

DELPH Delph 1

DCO

**FAO Names:** En - Common dolphin; Fr - Dauphin commun; Sp - Delfín común.



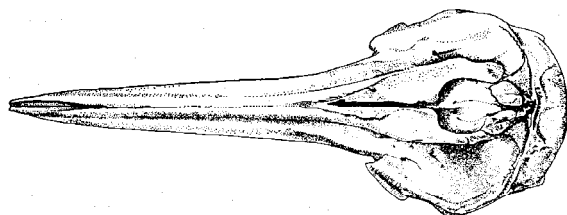
Fig. 343 *Delphinus delphis*

**Distinctive characteristics:** The common dolphin is a moderately slender animal (although some offshore animals are rather stocky) with a medium to long beak and a tall, slightly falcate dorsal fin.

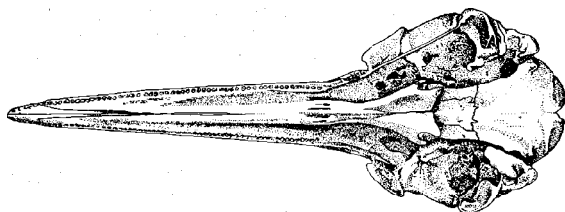
Common dolphins are strikingly marked, with a dark brownish grey back, white belly, and tan to ochre anterior flank patch. This flank patch dips below the dorsal fin and combines with streaks of light grey on the tail stock to produce the species' most characteristic feature, an hourglass pattern on the side. The lips are dark, and there is a stripe running from the apex of the melon to encircle the eye. There is also a black to dark grey chin-to-flipper stripe, and sometimes a thinner stripe running towards the area of the anus.

There are 40 to 61 small pointed teeth per row.

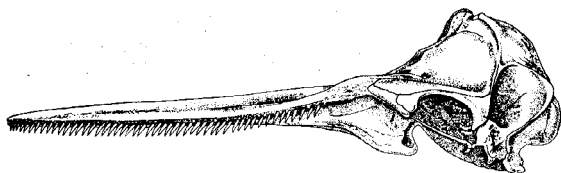
Common dolphins are highly geographically variable, and many regional forms have been described. In several parts of the world, 2 types of common dolphins appear to exist: a long-beaked coastal type (generally with a muted colour pattern), and an offshore type with a shorter beak (the latter comprises several stocks in the eastern tropical Pacific). Recent research indicates that these 2 types represent separate species.



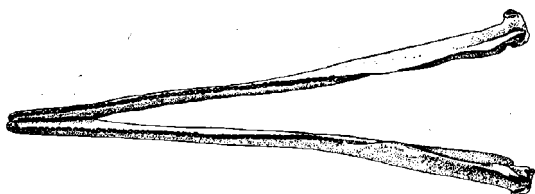
DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW



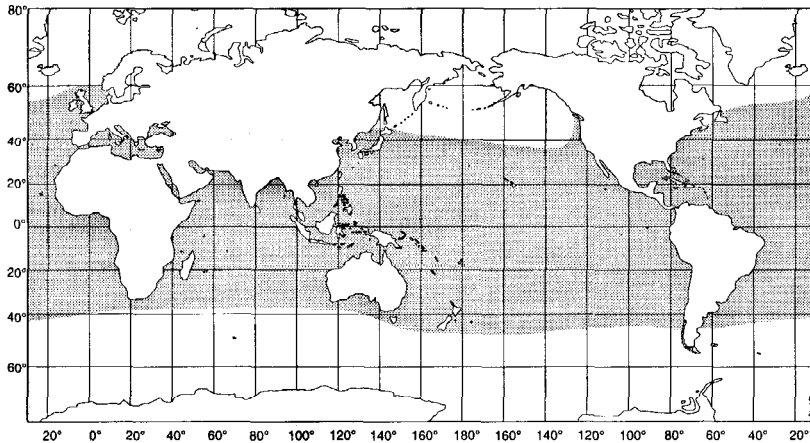
DORSAL VIEW OF MANDIBLE

Fig. 344 Skull of long-beaked form

**Can be confused with:** The hourglass pattern on the side should allow common dolphins to be distinguished from other species. Clymene dolphins (p. 162), especially when viewed from above, can look very much like short-snouted forms of common dolphins. A good look at the cape should allow the 2 to be distinguished.

**Size:** At birth, common dolphins are 80 to 85 cm long. Adults reach lengths of 2.3 m (females) or 2.6 m (males). Weights of up to 135 kg have been recorded. There is a substantial geographical variation.

**Geographical Distribution:** The common dolphin is a largely oceanic species that is widely distributed in tropical to warm temperate waters of the world. Absolute limits are about 60°N in the North Atlantic, 50°N in the North Pacific, and 50°S in the Southern Hemisphere.



**Fig. 345**

**Biology and Behaviour:** Large boisterous groups of common dolphins are often seen whipping the ocean's surface into a froth as they move along at high speed. Herds range in size from several dozen to over 10 000. Associations with other marine mammal species are not uncommon. Active and energetic bowriders (except in prime tuna fishing zones of the eastern tropical Pacific), common dolphins are very familiar to most seagoers in low latitudes. They are often aerially active and highly vocal; sometimes their squeals can be heard above the surface as they bowride.

Breeding peaks in spring and autumn or summer have been reported for some stocks.

The prey of common dolphins consists largely of small schooling fish and squid. Cooperative feeding techniques are sometimes used to herd fish schools. In some areas, common dolphins feed mostly at night on creatures associated with the deep scattering layer (DSL), which migrates toward the surface in the dark.

**Exploitation:** Common dolphins are taken in many fisheries worldwide. Huge catches by Turkish and Russian fishermen formerly occurred in the Black Sea. Common dolphin stocks there have declined and the fishery has not operated recently; however, there are some reports that it has started up again. The tropical Pacific tuna fishery takes common dolphins from several stocks, and some of these may have been depleted by past levels of mortality. High mortality also occurs off Japan and in the Mediterranean. Some dolphins of this species have been captured live, but do not do as well in captivity as the more coastal bottlenose dolphin. There are known captures elsewhere, as well, such as off West Africa.

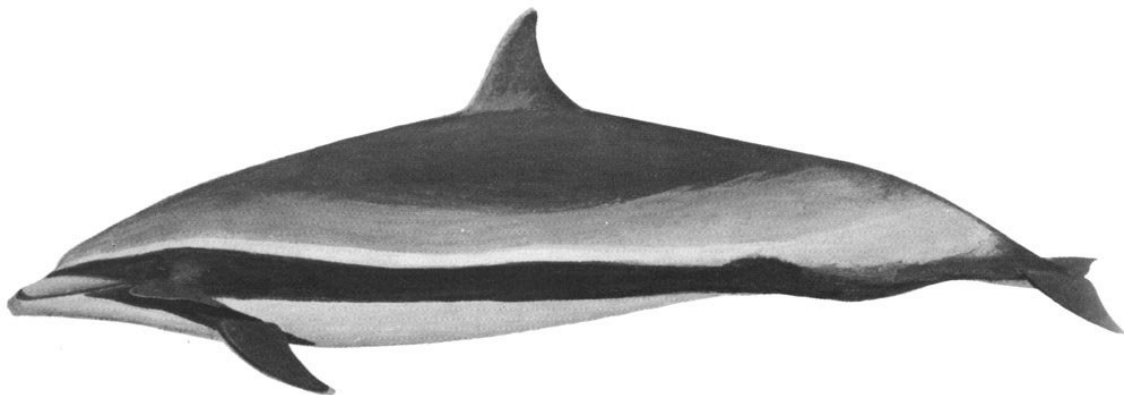
**IUCN Status:** Insufficiently known.

***Lagenodelphis hosei*** Fraser, 1956

**DELPH** Lagen 1

**FRD**

**FAO Names:** En - Fraser's dolphin; Fr - Dauphin de Fraser; Sp - Delfín de Fraser.

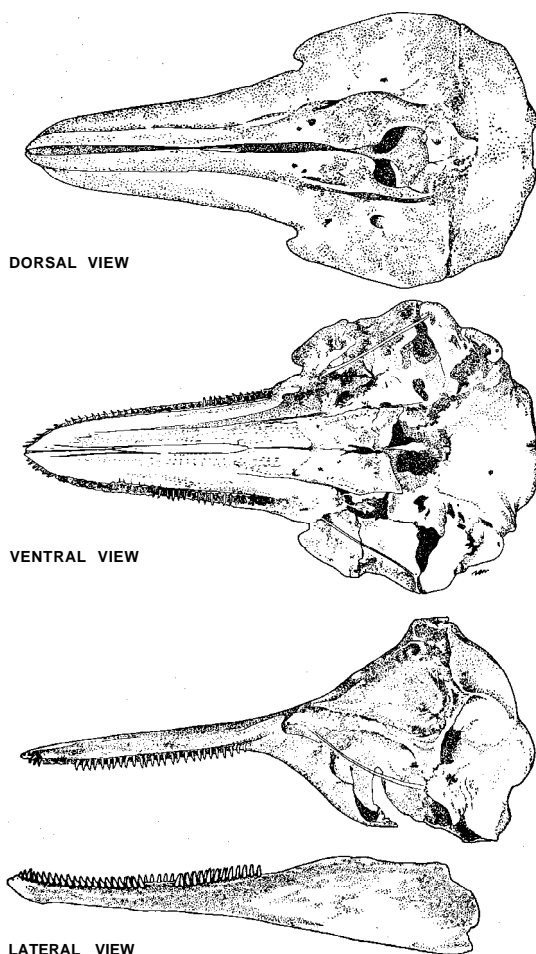


**Fig. 346 *Lagenodelphis hosei***

**Distinctive Characteristics:** For a decade and half, this species was known only from skeletal material, until it was "rediscovered" in the early 1970's. It is a distinctive dolphin, with a stocky body and extremely small appendages. The short dorsal fin is triangular or slightly falcate. There is a very stubby, but well-defined, beak.

The colour pattern is striking; the most distinctive feature is a dark band of varying thickness, running from the face to the anus (in some regions, the band is indistinct). This band is scarcely apparent on young animals, and appears to widen and darken with age in some animals. There is also a flipper stripe that starts at midlength along the lower jaw (in some animals the side stripe is so wide that it merges with the flipper stripe, creating a dark face mask). Otherwise, the back is dark brownish grey, the lower sides are cream coloured, and the belly is white or pink. Young animals in particular may have pinkish bellies.

There are 38 to 44 pairs of sharp teeth in each jaw.

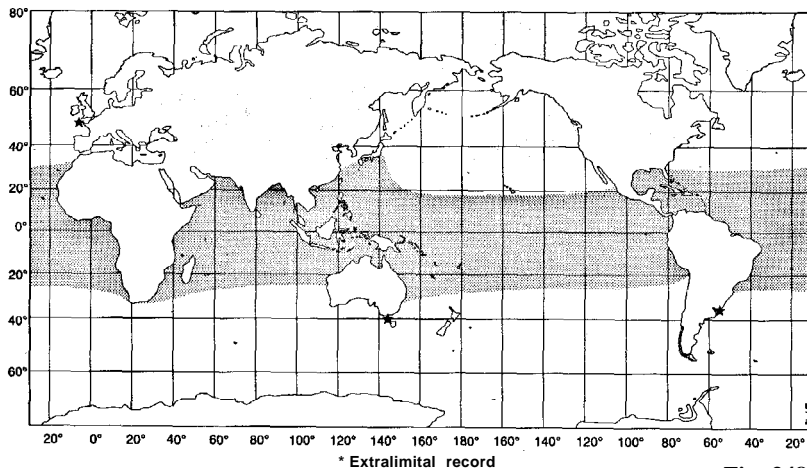


**Fig. 347 Skull**

**Can be confused with:** The unique body shape of Fraser's dolphin should rule-out confusion with other species, but striped dolphins (p. 164) which also have an eye-to-anus stripe, can be confused with Fraser's at a distance.

**Size:** Maximum size is at least 2.7 m. They may reach weights of over 210 kg. Newborns are less than 1 m long.

**Geographical Distribution:** Fraser's dolphin has a pantropical distribution, largely between 30°N and 30°S. It is an oceanic species, but can be seen near shore where deep water approaches the coast.



**Fig. 348**

**Biology and Behaviour:** There is little known of this tropical and subtropical species. Herds tend to be large, consisting of hundreds or even thousands of dolphins, often mixed with other species, especially melon-headed whales in the eastern tropical Pacific, Philippines and Gulf of Mexico, and Risso's dolphins and spinner dolphins in the Philippines. In some areas, it is considered shy and difficult to approach; in others it is a bit more approachable. It does not bowride in the eastern tropical Pacific, but it does in most other areas. Running herds create a great deal of white water.

There is not much known of reproductive biology.

Fraser's dolphins appear to feed on mid-water fish, squid, and crustaceans.

**Exploitation:** Catches in various fisheries throughout the range are known; however, none appear to be seriously affecting numbers. A few have been captured live and some killed in harpoon and net fisheries in the Philippines. They are occasionally taken in the Japanese drive fishery, and some are taken in Sri Lanka, the Caribbean, and Indonesia.

**IUCN Status:** Insufficiently known.

***Lissodelphis borealis*** (Peale, 1848)

**DELPH Liss 2**

**RNW**

**FAO Names:** **En-** Northern right whale dolphin; **Fr -** Dauphin à dos lisse boréal; **Sp -** Delfín líso del norte.

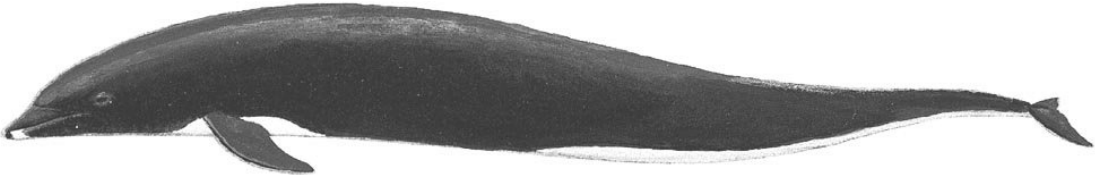
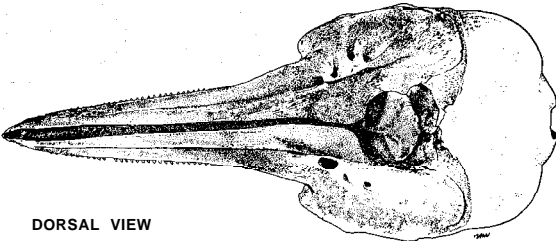


Fig. 349 *Lissodelphis borealis*

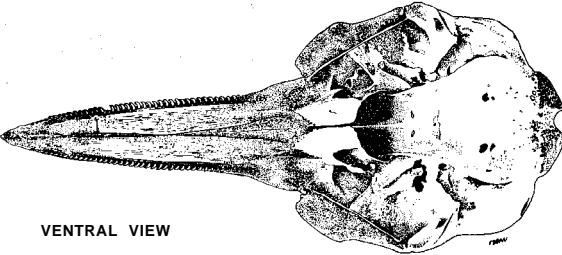
**Distinctive Characteristics:** The northern right whale dolphin and its Southern Hemisphere relative are the most slender of all small cetaceans. At close range, northern right whale dolphins are unmistakable; they are the only small cetaceans in their range with no dorsal fin. The flukes and flippers are small, and the beak is short, but well-defined.

Northern right whale dolphins are primarily black, with a white band from the throat to the fluke notch that widens to cover the entire area between the flippers, and a white spot just behind the tip of the lower jaw. The trailing edges of the flukes have light grey edging above and white below. Young animals have muted colour patterns of dark grey and light grey.

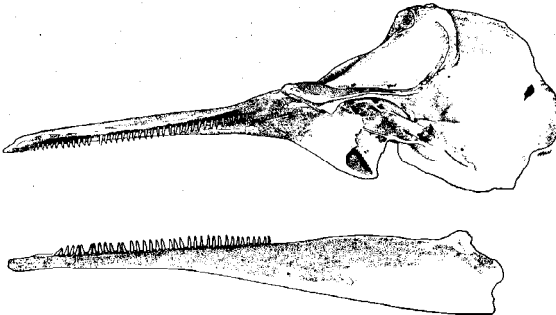
The mouth contains 37 to 54 pairs of sharp, slender teeth in each jaw.



DORSAL VIEW



VENTRAL VIEW



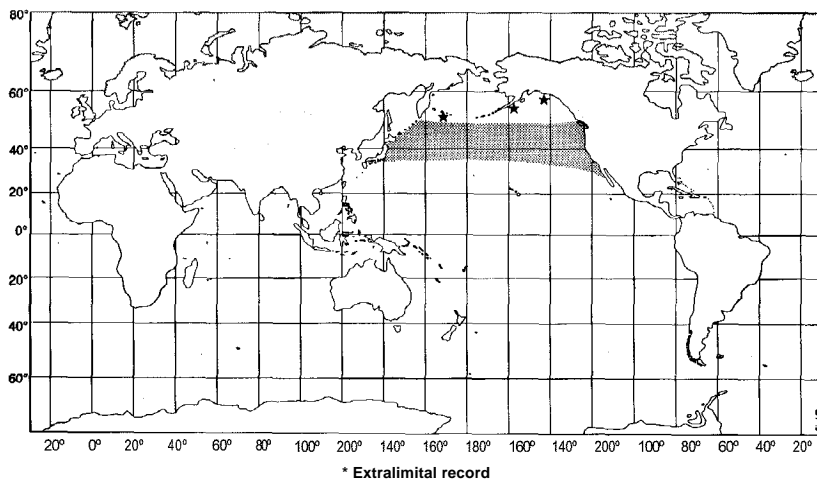
LATERAL VIEW

Fig. 350 Skull

**Can be confused with:** The slender finless body will allow easy separation from other North Pacific small cetaceans. However, porpoising California sea lions (p. 230), at a distance, can be confused with northern right whale dolphins.

**Size:** Measured adults have been up to 2.3 m (females) and 3.1 m (males). Length at birth is unknown, but is thought to be approximately 1 m. Maximum known weight is 115 kg.

**Geographical Distribution:** The northern right whale dolphin is an oceanic species, inhabiting cold and warm temperate regions of the North Pacific, mostly between about 30°N and 50°N.



**Fig. 351**

**Biology and Behaviour:** Most herds number between 100 and 200 individuals, but groups of up to 3 000 have been seen. These groups commonly mix with other marine mammals, especially the Pacific white-sided dolphins (with which they share a nearly identical range). Northern right whale dolphins are fast swimmers, sometimes creating a great surface disturbance with their low-angle leaps and belly flops. They bowride, especially when accompanied by other species of dolphins.

There appears to be a calving peak in winter to early spring.

Although squid and lanternfish are the major prey items for right whale dolphins off southern California, a variety of surface and mid-water species are taken by this species.

**Exploitation:** Occasional incidental catches in the eastern Pacific and both direct and accidental catches in the western Pacific do not appear to be seriously affecting stocks. However, in the central Pacific, the northern right whale dolphin appears to be the primary species of small cetacean taken in recent years by the Japanese, Taiwanese, and Korean squid driftnet fisheries, with numbers apparently approaching 20 000 per year.

**IUCN Status:** Insufficiently known,



***Lissodelphis peronii*** (Lacépede, 1804)

DELPH Liss 1

RSW

**FAO Names:** En - Southern right whale dolphin; Fr - Dauphin aptère austral; Sp - Delfín liso austral.

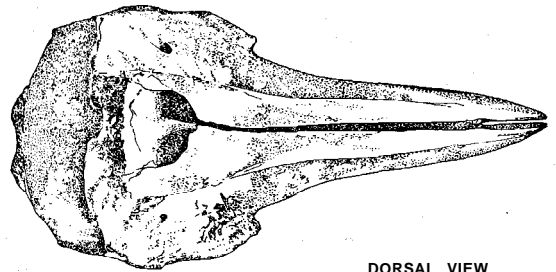


**Fig. 352 *Lissodelphis peronii***

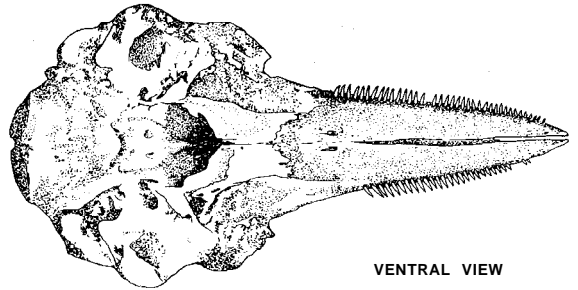
**Distinctive Characteristics:** Southern right whale dolphins, along with their Northern Hemisphere counterparts, are the most slender of all cetaceans. The body shape is essentially the same as in the northern right whale dolphin, with a short, well-demarcated snout, small recurved flippers, extremely narrow (top to bottom) tail stock, small flukes with a concave trailing edge, and no hint of a dorsal fin or ridge.

The white coloration of the ventral area extends well up the sides; the sharp line demarcating black above and white below runs from the tail stock forward, dips down to the flipper insertion, and then sweeps back up to cross the melon between the blowhole and snout crease. The flippers are generally white, but the trailing edge has a black band. The flukes are white below, and dark grey, fading to white on the leading edge, above.

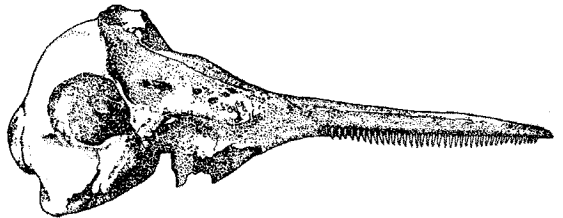
The mouth is lined with 44 to 49 sharp, pointed teeth in each row.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

**Fig. 353 Skull**

**Can be confused with:** The unique body shape of this species should make it easy to distinguish from other species.

**Size:** These dolphins reach lengths of at least 3 m and weights of 116 kg. Length at birth is probably about 1 m.

**Geographical Distribution:** Southern right whale dolphins are found only in cool temperate to subantarctic waters of the Southern Hemisphere. The southern limit appears generally to be bounded by the Antarctic Convergence. The range extends furthest north along the west coast of continents, due to the cold counterclockwise currents of the Southern Hemisphere. The northernmost record is at 12°S in northern Peru. This is an open-ocean species, coming close to shore only in deep water coastal areas.

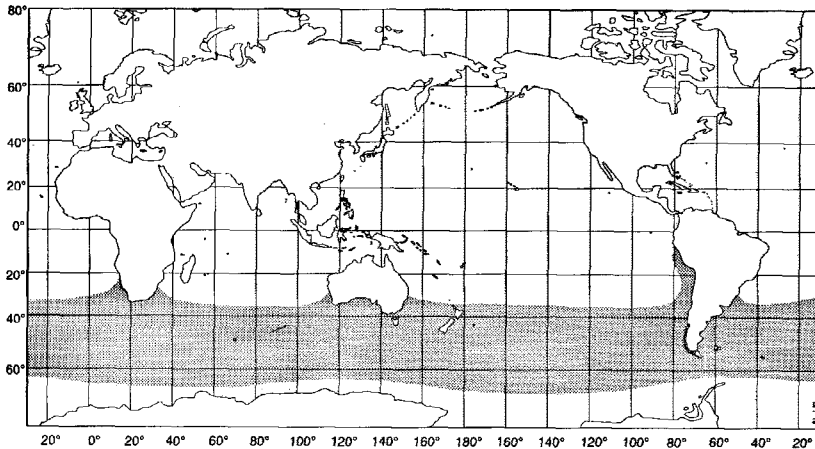


Fig. 354

**Biology and Behaviour:** Large schools are characteristic of the southern right whale dolphin. Some estimates of group size range to over 1 000 animals. Associations with other marine mammal species are common, especially dusky dolphins and pilot whales. Like their northern cousins, dolphins of this species are active energetic swimmers, often coming out of the water in clean low-angle leaps as they move at speed. Fluke slaps and other aerial displays are common. Southern right whale dolphins occasionally bowride.

Almost nothing is known of this species' reproductive biology.

A variety of fish and squid have been reported as prey; lanternfish are especially common.

**Exploitation:** Although occasionally taken by whalers in the 1800s for food, southern right whale dolphins appear to be nowhere heavily hunted. They are known to be taken incidentally in driftnets along the coasts of Peru and Chile, and some are taken in the Peruvian small cetacean fishery.

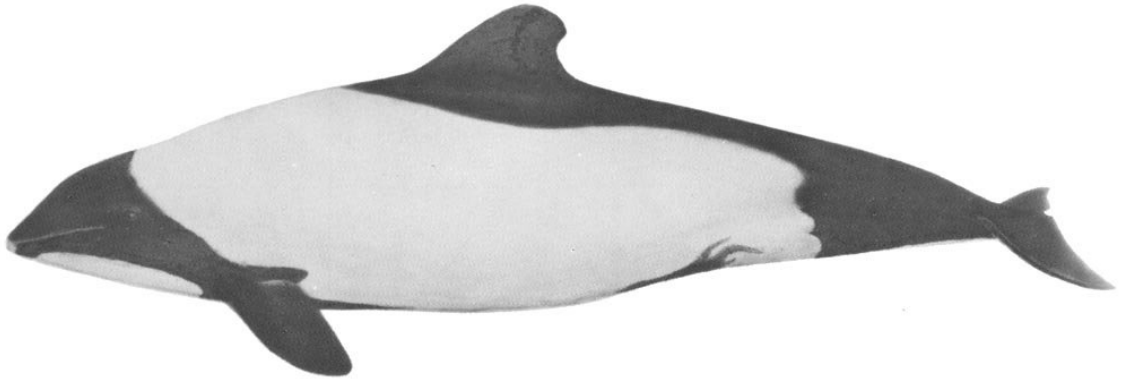
**IUCN Status:** Insufficiently known.

***Cephalorhynchus commersonii*** (Lacépède, 1804)

DELPH Ceph 1

CMD

**FAO Names:** En- Commerson's dolphin; Fr - Dauphin de Commerson; Sp - Tonina overa .



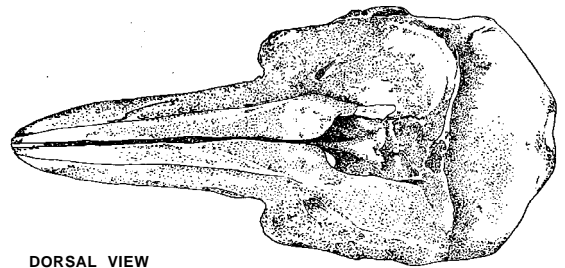
**Fig. 355 *Cephalorhynchus commersonii***

**Distinctive Characteristics:** The stocky Commerson's dolphin is similar in body shape to porpoises (phocoenids), as are other species of the genus. The head is blunt, with little or no beak and a relatively straight mouthline. The dorsal fin is moderately low and rounded, rising at a shallow angle from the back; the flippers and flukes have rounded tips.

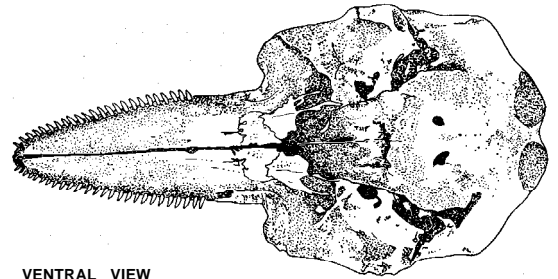
The colour pattern is strikingly contrasted black and white (dark grey and light grey in the Kerguelen Islands). There is a white band that completely encircles the body dorsally from just behind the blowhole to in front of the dorsal fin, and ventrally from behind the flippers to behind the genital area. There is a large white patch on the throat, and a black oval to heart-shaped patch around the genitals that varies in shape between males and females (females generally have the heart-shaped patch pointing forward, males pointing backward). The rest of the animal is black, including the top of the head, flippers, dorsal fin, and flukes. Newborn animals have a muted pattern of mostly grey tones, as do many small cetaceans.

There are 28 to 35 small, pointed teeth in each tooth row.

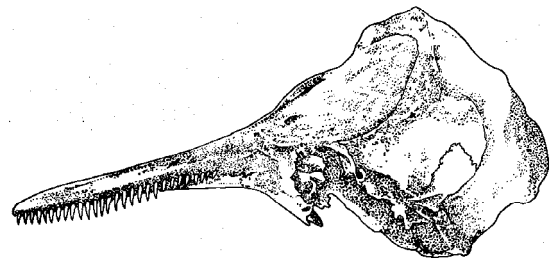
The Kerguelen Islands population is apparently distinct. These animals are larger than South American ones, and have shades of grey replacing black and white in the colour pattern.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW



**Fig. 356 Skull**

**Can be confused with:** The only other black and white small cetacean likely to be confused with this species is the spectacled porpoise (p. 184) but the dorsal-fin shape and colour pattern differences should make these 2 easily discernable. In some areas, Commerson's dolphins may also be confused with black dolphins (p. 180) which are mostly dark grey.

**Size:** Length at birth ranges from 65 to 75 cm. Off South America, the adult size of Commerson's dolphin is up to 1.5 m and 66 kg; those off the Kerguelen Islands reach 1.75 m and 86 kg. Females are slightly larger than males in this species.

**Geographical Distribution:** There are at least 2 disjunct populations of Commerson's dolphins, those off South America and the Falkland Islands, and those off the Kerguelen Islands. There are unsubstantiated reports of this species at South Georgia, but these are rejected by recent workers. Commerson's dolphins appear to prefer relatively shallow coastal waters, but some populations move slightly offshore in winter.

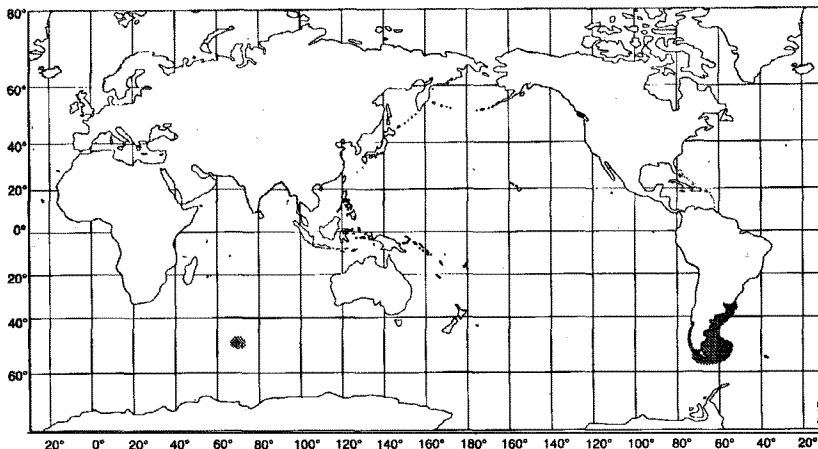


Fig. 357

**Biology and Behaviour:** Small groups of less than 10 individuals are the norm for this species, although they do sometimes aggregate into groups of over 100. These are quick, active animals. They are known to ride bow waves and to engage in various types of leaps. Commerson's dolphins often swim upside down.

The breeding season is in the southern spring and summer, September to February.

Feeding is on various species of fish, squid, and shrimp. Commerson's dolphins appear to be opportunistic, feeding primarily near the bottom.

**Exploitation:** Gillnet incidental catches probably represent the greatest threat to Commerson's dolphin populations, but they are also taken directly for crab bait in southern Chile. The effects of these kills on the populations involved are not known. Some Commerson's dolphins have been captured live in recent years, and the species appears to have done relatively well in captivity.

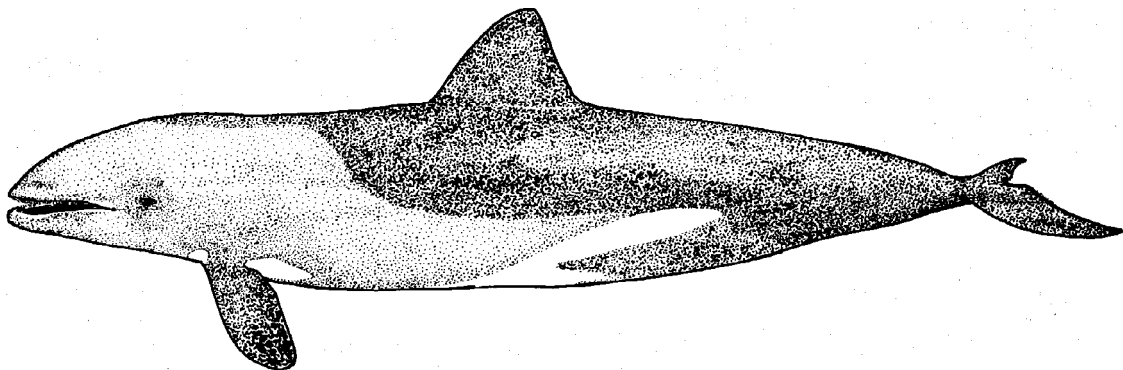
**IUCN Status:** Insufficiently known.

***Cephalorhynchus heavisidii*** (Gray, 1828)

DELPH Ceph 2

HVD

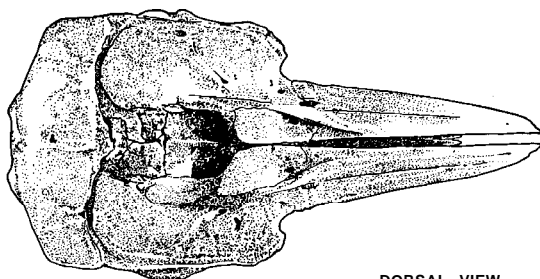
FAO Names: **En** - Heaviside's dolphin; **Fr** - Dauphin d' Heaviside; **Sp** - Delfin de Heaviside.

Fig. 358 *Cephalorhynchus heavisidii*

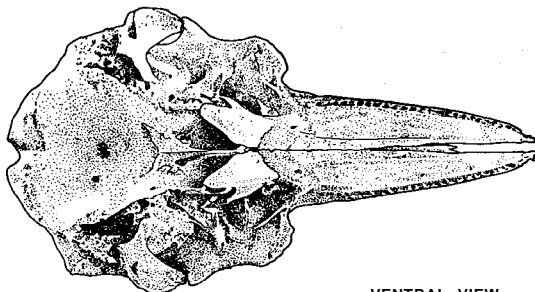
**Distinctive Characteristics:** Heaviside's dolphin is one of the most poorly known of all cetaceans. The shape of the body is similar to that in other *Cephalorhynchus* dolphins: stocky, with a short blunt snout, and blunt-tipped flippers. The dorsal fin is more triangular than the rounded fins of the other genus members, but it is taller than in most porpoises.

The body is predominantly grey, with a dark cape, which starts at the blowhole, remains extremely narrow in the thoracic region and then widens to dip low on the side below the dorsal fin. The area around the eye and much of the face is often darker grey. There is a white ventral patch that begins just behind the flippers, and splits into 3 arms behind the umbilicus. The middle arm encloses the urogenital area and the side arms extend only to below the midline. There is also a white diamond-shaped patch between the anterior insertions of the flippers, and separate white spots in the axillae. Several predominantly white individuals have been seen.

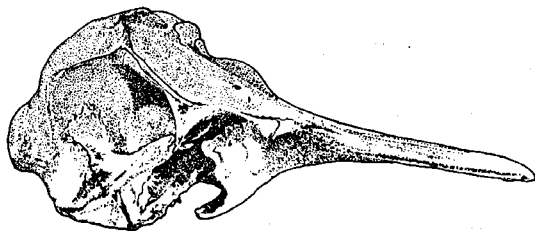
Heaviside's dolphins have 22 to 28 small, sharp teeth in each tooth row.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 359 Skull

**Can be confused with:** The only other small cetaceans within this species' range are larger dolphins, whose falcate dorsal fins should be easy to distinguish.

**Size:** Adults of this species are up to about 1.7 m in length. Newborn size is unknown, but is likely to be somewhat less than 1 m.

**Geographical Distribution:** This species of dolphin is found only off southwest Africa, from about 17°S to the southern tip of Africa. As are other species in the genus, it is a coastal, shallow water animal.

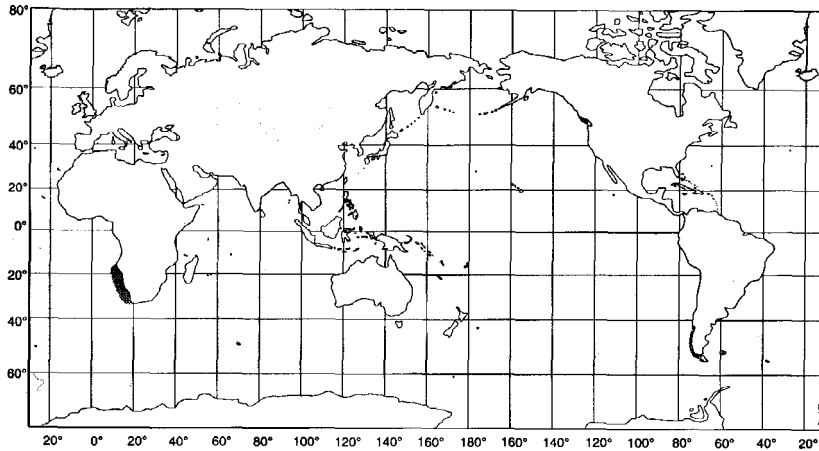


Fig. 360

**Biology and Behaviour:** Very little is known of the biology of this species. They are seen mostly in small groups of less than 10, with pairs and trios being most common. Heaviside's dolphins are not generally active or boisterous, but they are known to ride bow waves on occasion.

Essentially, nothing is known of their reproductive biology.

The available information on feeding is meagre, but Heaviside's dolphins are known to eat several varieties of fish and cephalopods.

**Exploitation:** Gillnets and other types of coastal fishing gear (trawls and purse seines) represent threats to Heaviside's dolphins, but there is little information on numbers of animals taken. There may also be some direct hunting by harpoon and other means.

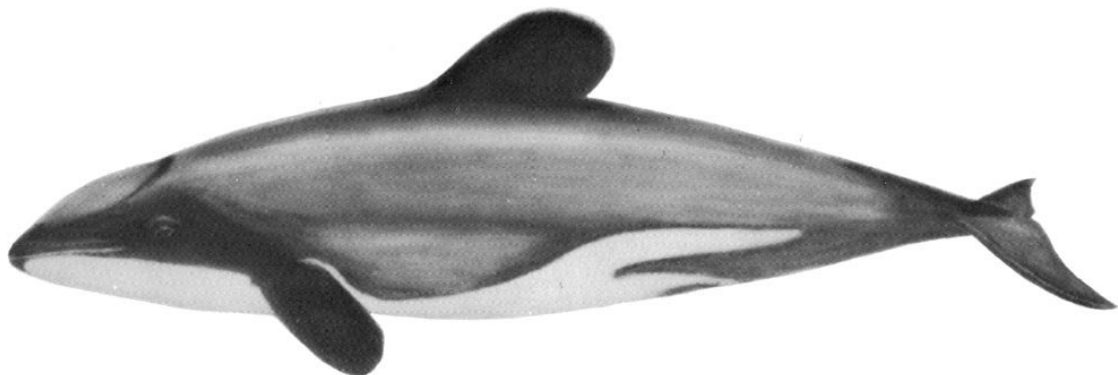
**IUCN Status:** Insufficiently known.

***Cephalorhynchus hectori*** (van Beneden, 1881)

DELPH Ceph 3

HCD

**FAO Names:** **En** - Hector's dolphin; **Fr** - Dauphin d'Hector; **Sp** - Delfin de Hector.

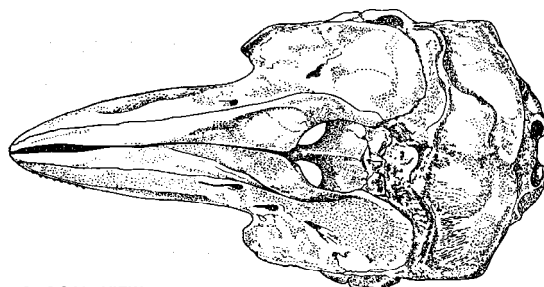


**Fig. 361** *Cephalorhynchus hectori*

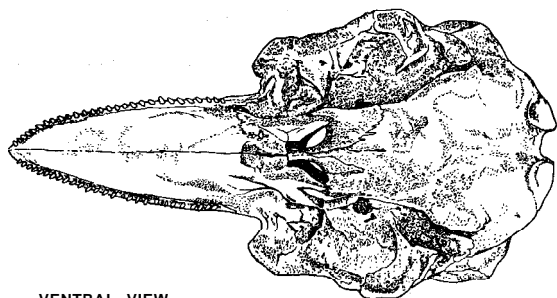
**Distinctive Characteristics:** The typical robust *Cephalorhynchus* body shape is evident in this species. The head is blunt, the dorsal fin is low and rounded, and the flippers are rounded at the tips.

The predominant colour of Hector's dolphin is light grey. The dorsal fin, flukes, flippers, area around the blowhole, and much of the face are dark grey to black. Ventrally, the animals are largely white. The lower part of the head, starting just behind the black lower jaw tip is white, as is the area from just behind the flippers to the urogenital area. Arms of white from this patch also extend part way up the sides. The white ventral patches can be invaded by black between the flippers, or can be completely separated by a continuous black area. There are also small white axillary and dark grey urogenital patches (the latter are smaller and not apparent in some females).

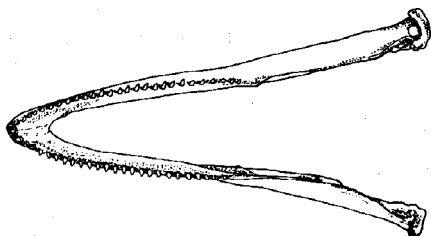
The mouth of a Hector's dolphin contains 24 to 31 fine pointed teeth in each row.



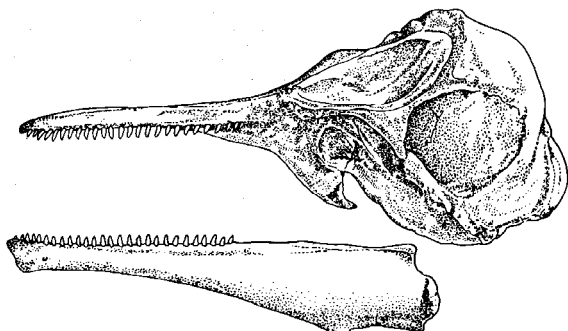
DORSAL VIEW



VENTRAL VIEW



DORSAL VIEW OF MANDIBLE



LATERAL VIEW

**Fig. 362** Skull

**Can be confused with:** Other dolphins (common, dusky, bottlenose, etc.) are found around New Zealand, but should be easy to distinguish from the small Hector's dolphin, largely on the basis of size and dorsal-fin shape.

**Size:** Hector's dolphin adults reach lengths of t.5 m (females are slightly larger than males), and newborns are about 60 to 70 cm long. Weights of up to 57 kg have been reported.

**Geographical Distribution:** This dolphin is endemic to New Zealand. They are found in shallow coastal waters, and are most common off South Island and the west coast of North Island.

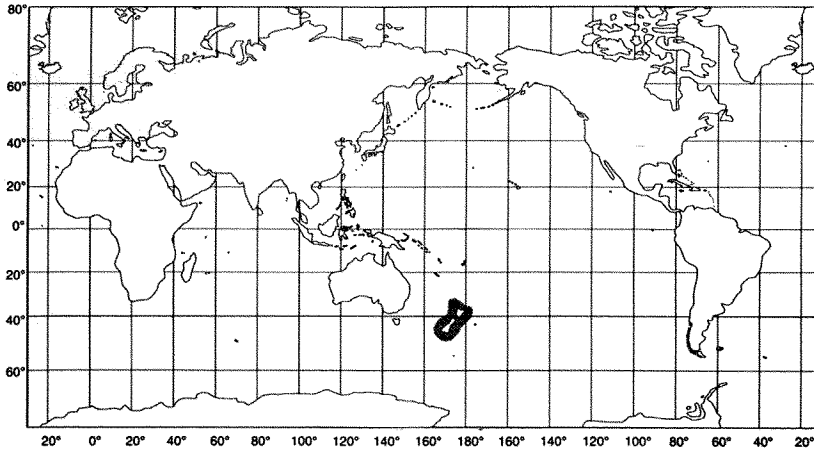


Fig. 363

**Biology and Behaviour:** The habits and biology of Hector's dolphin have been well studied only in the last few years. They live in groups of 2 to 8 individuals. Larger aggregations of up to 50 can be seen at times. These are active, acrobatic dolphins, and they are known to engage in bowriding activity. Photo-identification studies have demonstrated that at least some individuals are resident in small areas year-round.

The calving season is in the spring through early summer.

Hector's dolphins engage in opportunistic feeding on several species of small fish and squid.

**Exploitation:** The catch of large numbers of Hector's dolphins in coastal gillnets, many of them used by recreational fishermen, has been documented in recent years. Due to evidence that the catches were seriously threatening the estimated 3 000 to 4 000 Hector's dolphins around New Zealand, the government of that country created a marine mammal sanctuary in 1989 to protect them.

**IUCN Status:** Indeterminate.



***Cephalorhynchus eutropia*** (Gray, 1846)

DELPH Ceph 4

CHD

FAO Names: **En** - Black dolphin; **Fr** - Dauphin noir du Chili; **Sp** - Delfín chileno.

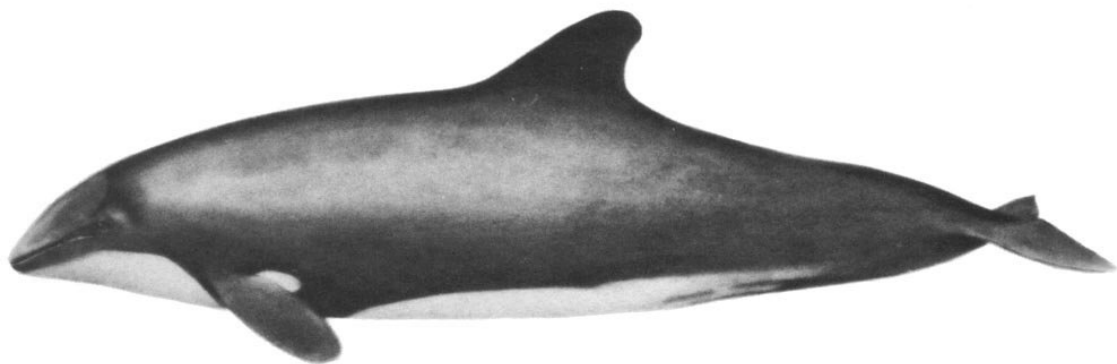
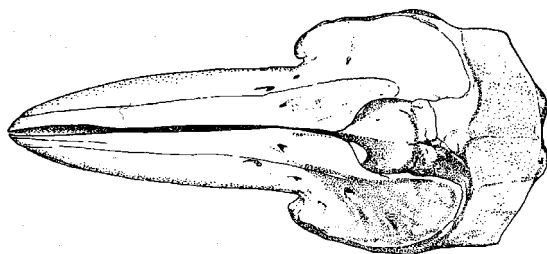


Fig. 364 *Cephalorhynchus eutropia*

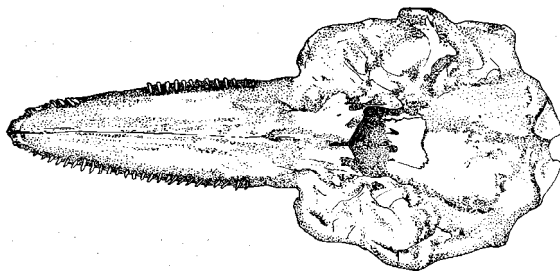
**Distinctive Characteristics:** This insufficiently known dolphin is robust, with a short, poorly defined beak. The dorsal fin is moderately low and rounded, and the flippers have rounded tips, much like those of other members of the genus.

The body is mostly grey, with a darker grey band extending from the blowhole to above the eye. There is often darker grey on the sides of the face, and in a wide band from around the eye to the flipper. On the belly are large white patches from behind the flippers to the urogenital area, and from ahead of the flippers to the snout tip. These patches are separated by a dark grey band between the flippers. There are also small white patches in the axillae, and thin grey patches around the urogenital area (the latter are sexually and individually variable).

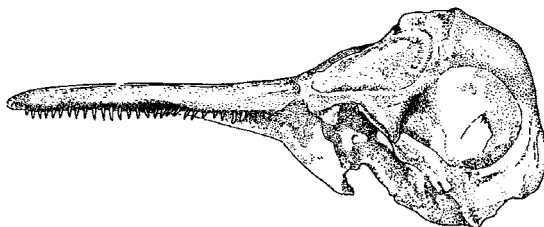
Black dolphins have 29 to 34 small pointed teeth in each row.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 365 Skull

**Can be confused with:** Black dolphins can be confused with Commerson's dolphins (p. 174) around the southern tip of South America. The large white areas on Commerson's dolphins are the best clue. Burmeister's porpoises (p. 188) may also be confused with this species. Here, dorsal-fin shape will be the best character to distinguish them.

**Size:** Adults of this species are up to at least 1.7 m (size at sexual maturity has not been sufficiently documented). Black dolphins reach weights of up to 63 kg. Length at birth is unknown, but is probably somewhat less than 1 m.

**Geographical Distribution:** This dolphin is found only on the Chilean coast, from 30°S to the tip of South America. As is true of other members of the genus, it is found in shallow coastal waters, and enters estuaries and rivers.

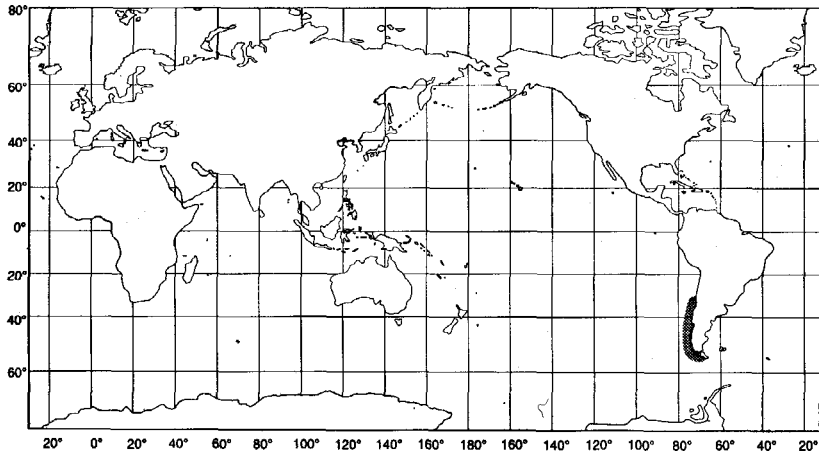


Fig. 366

**Biology and Behaviour:** Until recently, there have been very few sightings of these animals by researchers. Groups tend to be small, between 2 and 15 members, but aggregations of up to 400 have been recorded. Although active and very conspicuous, they tend to be shy and difficult to approach, but may occasionally ride bow waves.

Most sightings of newborn black dolphins have been from October to April.

Black dolphins feed on fish, cephalopods, and crustaceans.

**Exploitation:** Black dolphins are taken both incidentally in gillnets (and occasionally in seines) and directly by harpoon in a fishery for crab bait off southern Chile. Incidental catches are also sometimes utilized for oil and human consumption. The effects of these fisheries on black dolphin population(s) are not known.

**IUCN Status:** Insufficiently known.

***Phocoenoides dalli*** (True, 1885)

PHOCO Phocoen 1

PDA

FAO Names: En - Dall's porpoise; Fr - Marsouin de Dall; Sp - Marsopa de Dall.

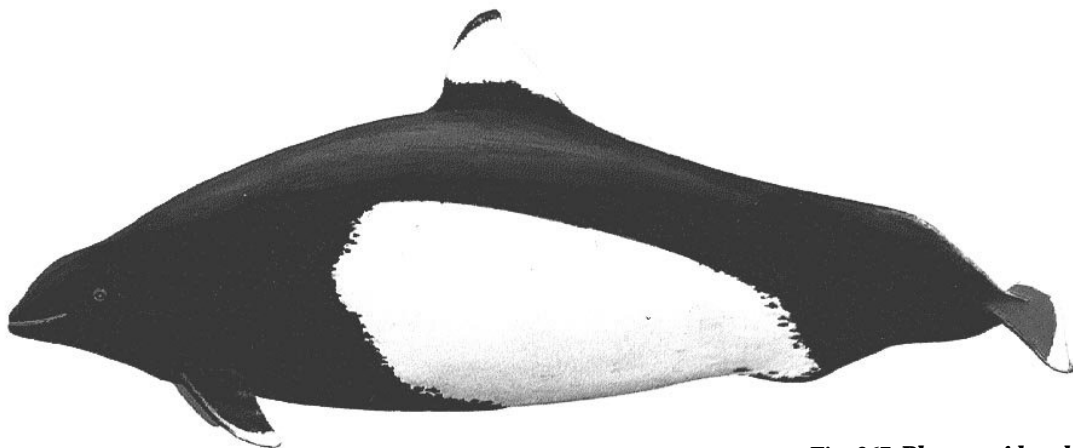
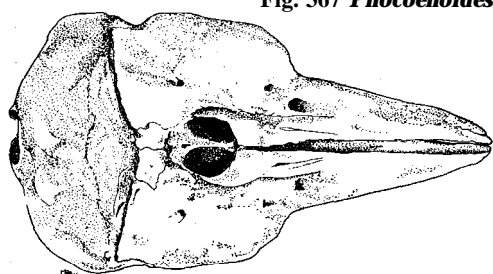


Fig. 367 *Phocoenoides dalli*

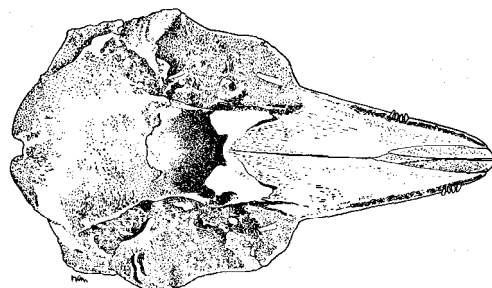
**Distinctive Characteristics:** These are robust animals, with a wide-based triangular dorsal fin, and small flippers placed near the head. The small head has a short beak, with no demarcation from the melon. From above, the head appears triangular.

Dall's porpoises are strikingly marked, with a black body and bright white flank patches that are continuous ventrally, although young animals have muted colour patterns. The flank patches extend from the urogenital area to just in front of the dorsal fin, and up the sides about midway. In addition, there is white to light grey "frosting" on the upper portion of the dorsal fin and the trailing edges of the flukes. There are 2 commonly occurring colour types, the dalli-type (described and illustrated above) and the truei-type (which has a larger flank patch that extends to the level of the flipper).

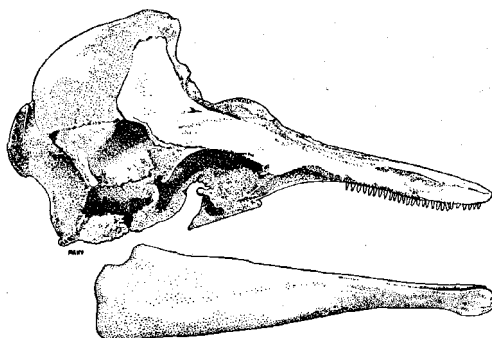
Dall's porpoise has the smallest teeth of any cetacean. There are 23 to 28 tiny spade-shaped teeth in each tooth row.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 368 Skull

**Can be confused with:** Dall's porpoises are likely to be confused only with harbour porpoises (p. 186), and even then, only if seen at a great distance. When seen well, the differences in colour pattern and dorsal-fin shape will be readily apparent.

**Size:** Newborn Dall's porpoises are about 1 m long. Adults are up to 2.2 m (females) or 2.4 m (males). Maximum weight is about 200 kg.

**Geographical Distribution:** Dall's porpoises are found only in the North Pacific Ocean and adjacent seas. They inhabit deep waters of the warm temperate through subarctic zones, between about 30°N and 62°N. There is apparently a single truei-type population that migrates between the Pacific coast of Japan and the Okhotsk Sea; dalli-types predominate in all other areas of the range.

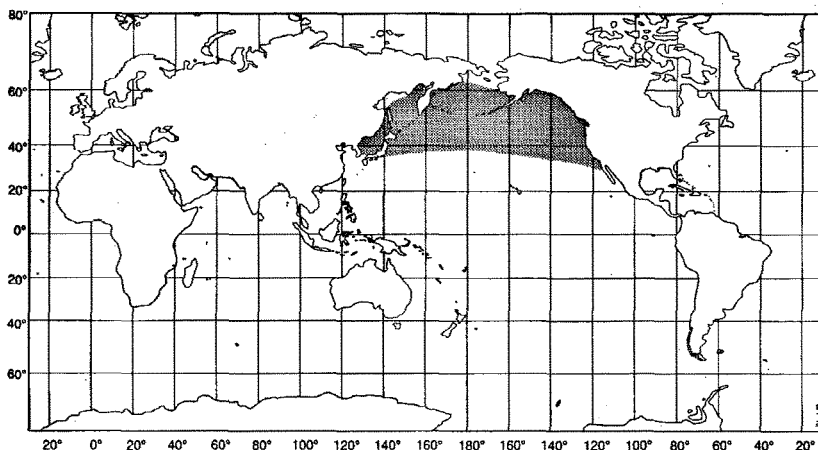


Fig. 369

**Biology and Behaviour:** This may be the fastest swimmer of all small cetaceans, at least for short bursts. When swimming rapidly, Dall's slice along the surface, producing a characteristic roostertail of spray. At other times, the animals move slowly and roll at the surface, creating little or no disturbance. These are avid bowriders, moving back and forth with jerky movements, and often coming from seemingly nowhere to appear at the bow of a fast-moving vessel. Breaching, porpoising, and other kinds of aerial behaviour, are extremely rare in this species. Dall's porpoises are found mostly in small groups of 2 to 12, although aggregations of up to several thousand have been reported. Groups appear to be fluid, often forming and breaking up for feeding and playing.

Most Dall's porpoise calves are born in spring and summer.

Dall's porpoises are opportunistic feeders, taking a range of surface and mid-water fish and squid, especially lanternfish and gonatid squid.

**Exploitation:** The International Whaling Commission currently recognizes 8 stocks, based on pollutant loads, parasite faunas, and distribution patterns of cow-calf pairs. Heavy exploitation occurs in the western Pacific, both in a directed harpoon fishery and in several gillnet fisheries, in which Dall's are caught incidentally. The Asian driftnet fisheries for squid and salmon took several thousand annually in recent years in the central Pacific. Although there are records of small numbers being taken incidentally in the eastern Pacific, stocks there, unlike those in the central and western Pacific, are supposedly not in any immediate danger.

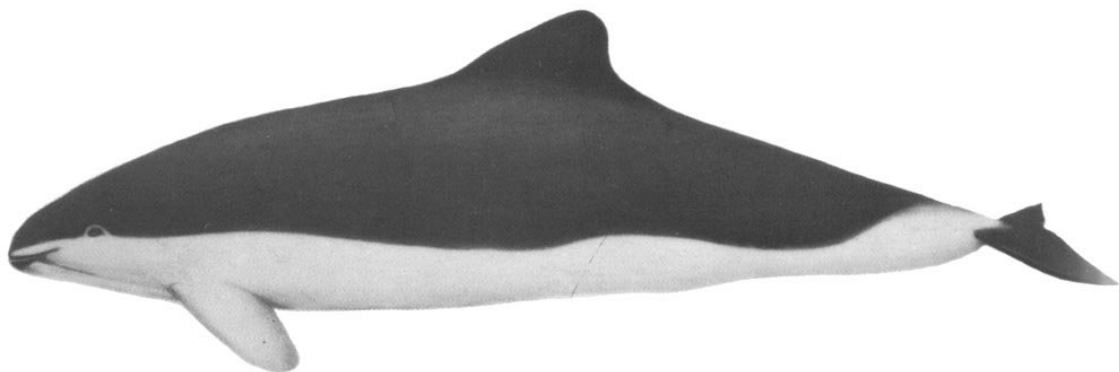
**IUCN Status:** Insufficiently known.

***Australophocaena dioptrica*** (Lahille, 1912)

PHOCO Aust 1

SPP

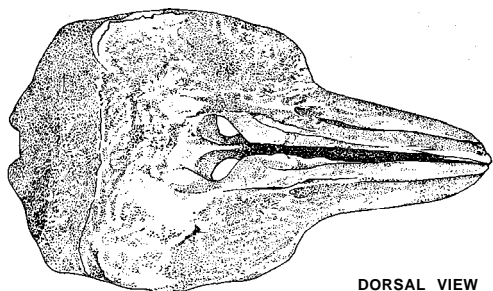
FAO Names: En - Spectacled porpoise; Fr - Marsouin de Lahille; Sp - Marsopa de anteojos.

Fig. 370 *Australophocaena dioptrica*

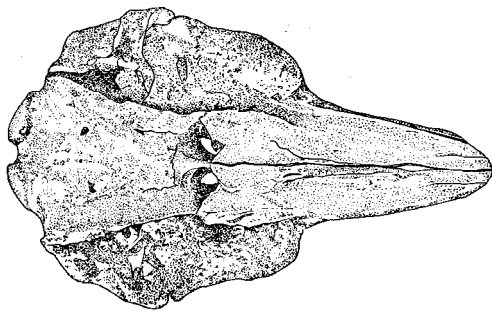
**Distinctive Characteristics:** In spectacled porpoises, the body shape is typically porpoise-like, but the dorsal fin is large and rounded (in some adult males, it becomes extremely large). The flippers are small, with rounded tips. The beak is short or non-existent.

The two-tone colour pattern of spectacled porpoises is very distinctive. Above a line that runs down the side at the level of the eye (except that the line extends upward at the tail stock, just before the flukes), they are black. Below this line, they are white, with the exception of black lips and a dark gape-to-flipper stripe (the latter is apparently not present on all adults). There is a black patch, surrounded by a fine white line, around the eye. The flukes are black above and white below; the flippers are variably coloured, either all dark or greyish white with grey edges. Young animals have muted grey patterns.

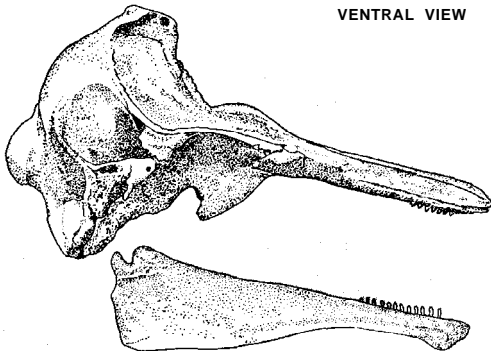
Inside the mouth are 17 to 23 (upper) or 17 to 20 (lower) spade-shaped teeth in each row.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 371 Skull

**Can be confused with:** The spectacled porpoise is not likely to be confused with other species, when seen well. But at a distance, there can be some confusion with Commerson's dolphin (p. 174) and Burmeister's porpoise (p. 188), which both share portions of its range. These 3 species can best be distinguished by dorsal-fin shape and colour pattern differences.

**Size:** Adult male spectacled porpoises reach lengths of at least 2.3 m and adult females are up to about 2.1 m. Newborns are probably about 1 m.

**Geographical Distribution:** Known primarily from the southern coast of eastern South America, from Uruguay to Tierra del Fuego, this species is apparently also found around offshore islands in the Southern Hemisphere. There are records from the Falkland Islands, South Georgia, Kerguelen Islands, Heard Island, Macquarie Island, and the Auckland Islands. Although rarely seen at sea, this information suggests that the spectacled porpoise may be circumpolar in the subantarctic. Sightings have occurred in offshore waters, as well as in rivers and channels.

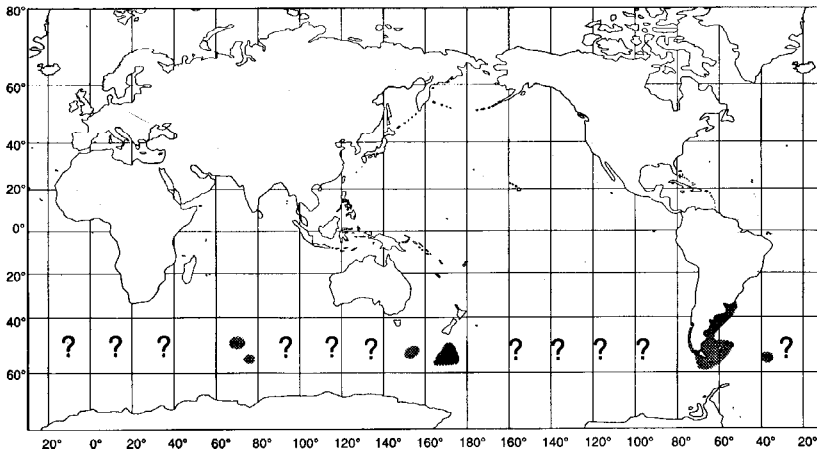


Fig. 372

**Biology and Behaviour:** In the few known sightings, group sizes were small, apparently mostly singles and pairs. These animals are very inconspicuous when surfacing.

Births appear to occur in the southern spring to summer. Essentially, nothing else is known of this species' behaviour and biology.

**Exploitation:** In the past, spectacled porpoises were killed deliberately for food. In Argentina and Chile, spectacled porpoises are taken in gillnets, and they may be taken deliberately for crab bait off southern Chile. The effects of these catches on spectacled porpoise populations are not known.

**IUCN Status:** insufficiently known.

***Phocoena phocoena*** (Linnaeus, 1758)

PHOCO Phoc 1

PHR

**FAO Names:** **En** - Harbour porpoise; **Fr** - Marsouin commun; **Sp** - Marsopa común.

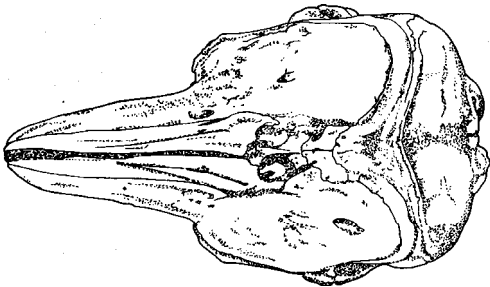


**Fig. 373 *Phocoena phocoena***

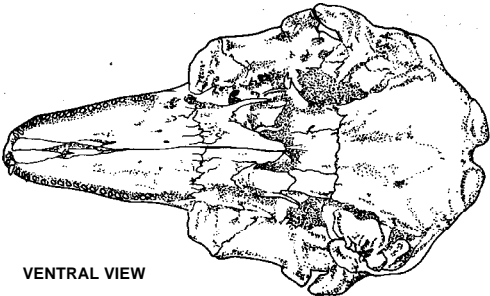
**Distinctive Characteristics:** The harbour porpoise is a chunky animal, with a blunt short-beaked head. Placed about midway along the back is a short, wide-based, triangular dorsal fin, with small bumps on the leading edge. The flippers are small and somewhat rounded at the tips. The flukes have a concave trailing edge, divided by a prominent median notch; the tips are rounded. The straight mouthline slopes upward towards the eye.

Countershading is apparent in the harbour porpoise's colour pattern; the animals are generally dark grey on the back and white on the belly. The sides are intermediate, with the border area often splotched with shades of grey. The flippers and lips are dark; there is a thin, dark grey gape-to-flipper stripe.

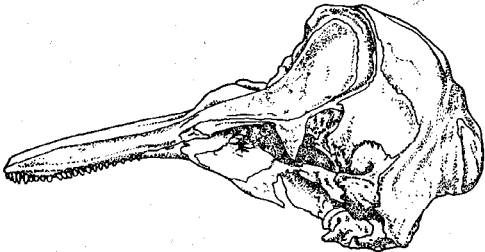
Nineteen to 28 small, spatulate, blunt teeth line each tooth row.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW



**Fig. 374 Skull**

**Can be confused with:** Harbour porpoises, if seen clearly, should not be confused with any of the various species of dolphins that share their range. The other porpoise that overlaps in the North Pacific, Dall's porpoise (p. 182), can be confused with this species when backlit fins are seen at a distance. However, the black and white colour pattern and slight difference in dorsal-fin shape of Dall's porpoise will be distinguishable, when seen well.

**Size:** Most adult harbour porpoises are less than 1.8 m long; maximum length is about 2 m. Females are slightly larger than males. Weights range from 45 to 70 kg for adults. Newborns are 70 to 90 cm long.

**Geographical Distribution:** Harbour porpoises are found in cool temperate and subpolar waters of the Northern Hemisphere. They are usually found in shallow water, most often nearshore, although they occasionally travel over deeper offshore waters. In the North Pacific, they range from southern California and northern Honshu, Japan, to the southern Beaufort and Chukchi seas. In the North Atlantic, they are found from the southeastern United States to southern Baffin Island (they apparently do not enter Hudson Bay) in the west and Senegal, West Africa, to Novaya Zemlya in the east. Major populations in the North Pacific and North Atlantic are isolated from each other, and many provisional stocks have been recognized.

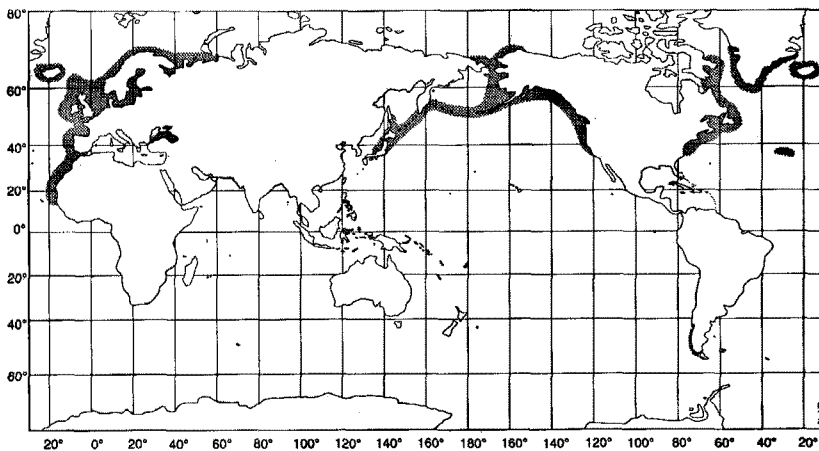


Fig. 375

**Biology and Behaviour:** Most harbour porpoise groups are small, consisting of less than 8 individuals. They do, at times, aggregate into large, loose groups of 50 to several hundred animals, mostly for feeding or migration. Behaviour tends to be inconspicuous, compared to most dolphins, and harbour porpoises rarely approach boats to ride bow waves. When moving fast, they surface in a behaviour often called pop-splashing. Breaches and other leaps are rarely seen. Harbour porpoises sometimes lie at the surface for brief periods between submergences, although we do not know why they do this.

Reproductive biology has been well-studied in some parts of the world. Most calves are born from spring through mid-summer.

Harbour porpoises eat a wide variety of fish and cephalopods, and the main prey items appear to vary regionally. Small, non-spiny schooling fish (such as herring and mackerel) are the most common prey in many areas, and many prey species are benthic or demersal.

**Exploitation:** A major human threat to harbour porpoises throughout their range is incidental capture in fisheries. Many thousands are taken each year in gillnets and in certain areas, incidental catches in herring weirs, cod and salmon traps, purse seines, trawl nets, and longlines also occur.

Directed fisheries have occurred in Puget Sound, the Bay of Fundy, Gulf of St. Lawrence, Labrador, Newfoundland, Greenland, Iceland, Black Sea, and the Baltic Sea. Many of these fisheries are now closed, but hunting of harbour porpoises still occurs in a few areas. Greenland and the Black Sea are the only areas where large direct catches have been reported recently.

Levels of pollutants in harbour porpoise tissues have been found to be high wherever studied, probably due to the species' coastal nature. Environmental contamination has been implicated, in part, for declines in harbour porpoise populations in Europe and some parts of North America.

**IUCN Status:** Insufficiently known.



***Phocoena spinipinnis*** Burmeister, 1865

**PHOCO** Phoc 2

**BRP**

**FAO Names:** En - Burmeister's porpoise; Fr - Marsouin de Burmeister; Sp - Marsopa espinosa.

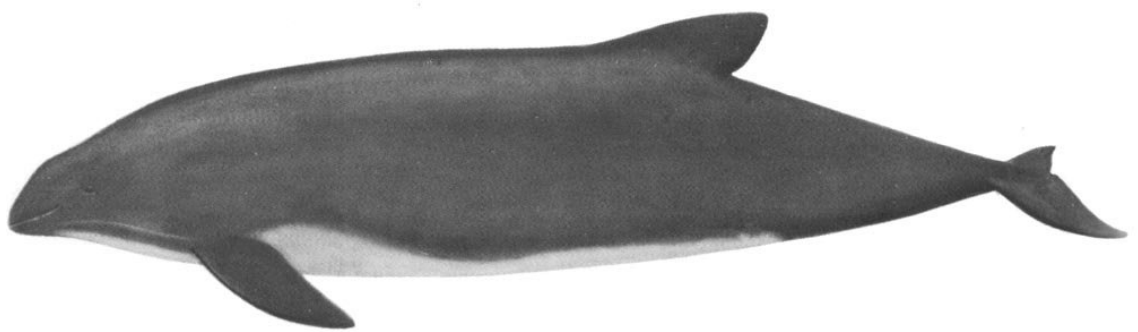
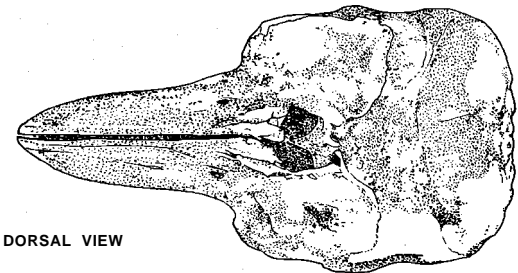


Fig. 376 *Phocoena spinipinnis*

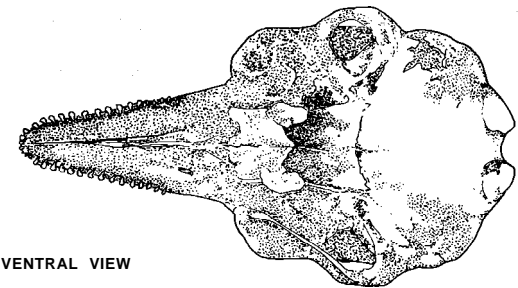
**Distinctive Characteristics:** The unique dorsal fin of Burmeister's porpoise rises at a very shallow angle from behind the midpoint of the back, and the trailing edge is straight to convex. Additionally, there are tubercles along the leading edge of the fin (this characteristic gave the species its scientific name). Other than this, the species has a rather typical phocoenid body form, with a blunt, nearly beakless head and broad-based flippers with rounded tips.

Coloration is dark charcoal to grey, with lighter grey streaks on the chin and belly. Burmeister's porpoises have dark eye patches, dark lips, and dark chin-to-flipper stripes (well-defined by lighter areas above and below). These flipper stripes are asymmetrical; they are more narrow and extend further forward on the right side.

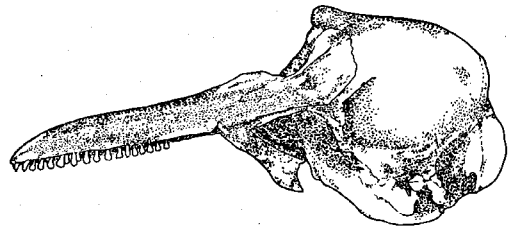
Teeth number 10 to 23 in each upper tooth row and 14 to 23 in each lower row. As in other phocoenids, the teeth are spatulate.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

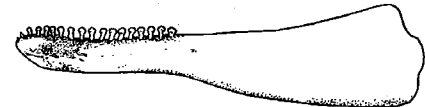


Fig. 377 Skull

**Can be confused with:** Burmeister's porpoises can be confused with South American fur seals (p. 246) and South American sea lions (p. 232) which often stick their flippers in the air (these can look like Burmeister's porpoise dorsal fins). Differences in coloration, dorsal-fin shape, and swimming style should allow Burmeister's porpoises to be distinguished easily from Commerson's dolphins (p. 174) and spectacled porpoises (p. 184), and head shape will be the best characteristic to allow distinction from franciscana (p. 202).

**Size:** Most adults are up to 1.85 m in length, although animals from Uruguay up to 2 m have been recorded. Maximum weight is about 85 kg. Newborns are 0.8 to 0.9 m.

**Geographical Distribution:** Burmeister's porpoises are distributed in coastal waters of South America, from southern Brazil, south to Tierra del Fuego, and north to northern Peru.

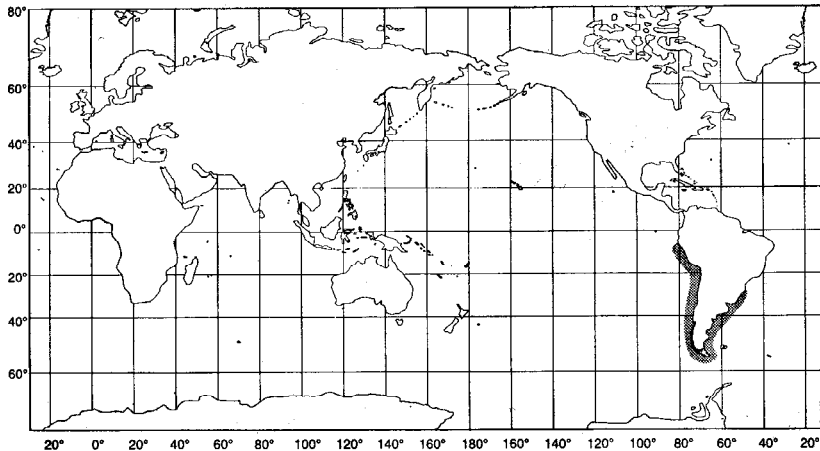


Fig. 378

**Biology and Behaviour:** Very little is known about the natural history of this species. Most sightings are of less than 6 individuals, but aggregations of up to 70 have been reported. Behaviour of this species is inconspicuous; they breath with little surface disturbance.

There appears to be a protracted summer birth peak; most births in Peru apparently occur in late summer to autumn.

Feeding is on fish, such as anchovies and hake, as well as squid.

**Exploitation:** Burmeister's porpoises are caught mostly in gillnets. They are taken, apparently in small numbers, in shark gillnets in Uruguay, fish (and until recently, king crab) gillnets around Tierra del Fuego, and gillnets for a variety of fish off Chile and Peru (by far, the largest kills). Additionally, they may be caught in direct fisheries for dolphins, using mostly gillnets, which have prospered in recent years in Peru, and to a lesser extent, Chile.

**IUCN Status:** Insufficiently known.

***Phocoena sinus*** Norris and McFarland, 1958

PHOCO Phoc 3

VAQ

**FAO Names:** En - Vaquita; Fr - Marsouin dugolfe de Californie; Sp- Vaquita.

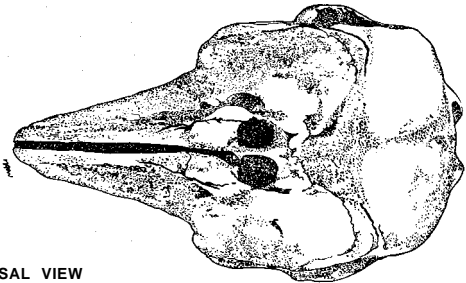


Fig. 379 *Phocoena sinus*

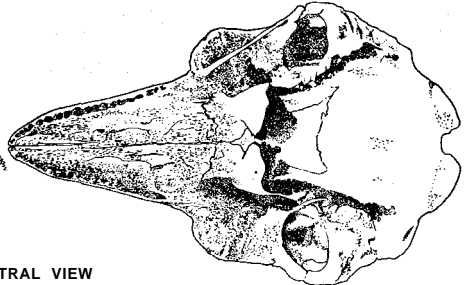
**Distinctive Characteristics:** The vaquita, or Gulf of California harbour porpoise, is among the smallest of all marine cetaceans. Compared to other phocoenids, it has a taller, more falcate dorsal fin and larger flippers. Like all porpoises, it is stocky, with a blunt beakless head.

Vaquitas have black to dark grey lip patches and eye rings; otherwise the body is light brownish grey fading to white on the belly. Calves tend to be somewhat darker than adults.

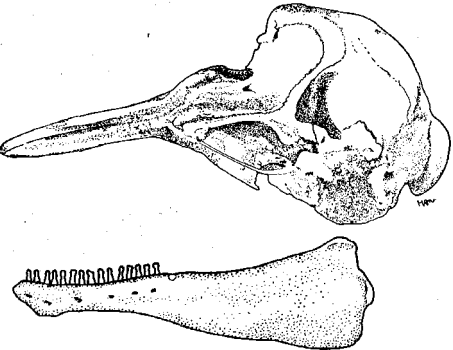
In the small number of specimens examined to date, there have been 16 to 22 pairs of teeth in the upper jaw and 17 to 20 pairs in the lower jaw.



DORSAL VIEW



VENTRAL VIEW



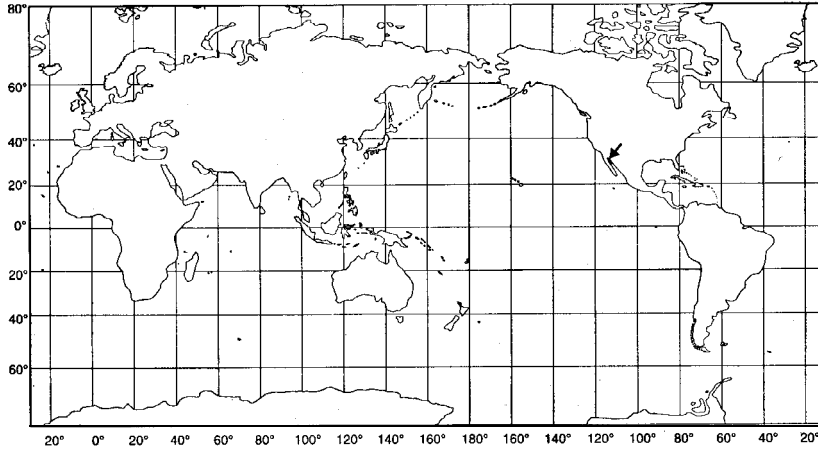
LATERAL VIEW

Fig. 380 Skull

**Can be confused with:** When seen at a distance, the tall dorsal fin of the vaquita must be distinguished from those of bottlenose (p. 154) and common (p. 166) dolphins, both of which are common in the vaquita's range. However, the small group size and unique body shape, as well as differences in behaviour, will generally allow the vaquita to be distinguished.

**Size:** Known maximum length is 1.5 m (females) and 1.45 m (males), but very few specimens have been examined.

**Geographical Distribution:** The habitat of the vaquita appears to be defined by relatively murky coastal waters in the northern quarter of the Gulf of California (although there are some suggestions that the range may extend further south in the Gulf as well). This is the most restricted range of any marine cetacean.



**Fig. 381**

**Biology and Behaviour:** Almost nothing is known of the biology of the vaquita. As is generally true for porpoises, they occur in small groups and are relatively inconspicuous in their behaviour.

Most calving apparently occurs in the spring.

**Exploitation:** The vaquita is in imminent danger of extinction, and is listed as an endangered species. The population may number only a few hundred individuals, and at least 30 to 40 are killed each year, mainly in large mesh gillnets set in the northern Gulf for totoaba, sea bass, rays, and sharks. Some are also taken in shrimp trawls. Recently, Mexico has taken some encouraging steps to try to save the vaquita.

**IUCN Status:** Endangered.

***Neophocaena phocaenoides*** (Cuvier, 1829)

PHOCO Neoph 1

PFI

**FAO Names:** En - Finless porpoise; Fr - Marsouin aptère; Sp - Marsopa lisa o sin aleta.

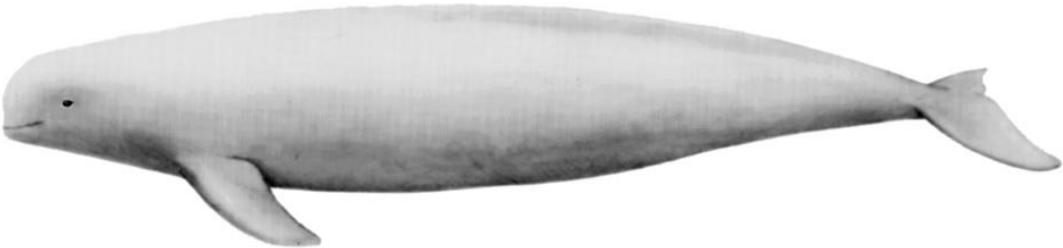
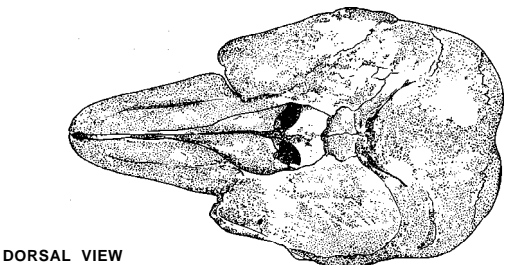


Fig. 382 *Neophocaena phocaenoides*

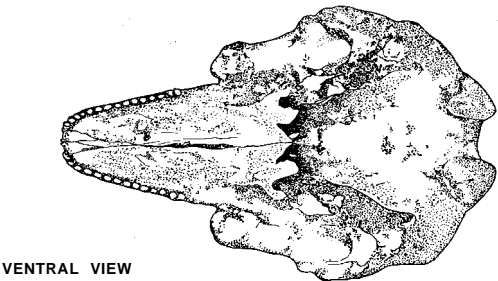
**Distinctive Characteristics:** As the name implies, finless porpoises have no dorsal fin, and this is their most distinctive characteristic. In some ways, they resemble small, slender white whales. The head is beakless; the rounded forehead rises steeply from the snout tip. The body shape, in general, is more slender than in other porpoises. The finless porpoise is soft and mushy, and the neck is very flexible. Instead of a dorsal fin, the finless porpoise has an area of small bumps or tubercles on its back, running from just forward of midback to the tail stock. The trailing edge of the flukes is concave and the flippers are large, ending in rounded tips. Regional differences in body size and morphology have been documented, with Yangtze River animals apparently representing a separate stock.

The common name that was used in the past, “finless black porpoise,” apparently resulted from descriptions of dead animals, after post-mortem darkening. In most areas, finless porpoises are grey in colour, with lighter areas on the throat and around the genitals. Older animals are generally lighter grey than juveniles. In the Yangtze River population, they are very dark grey, nearly black.

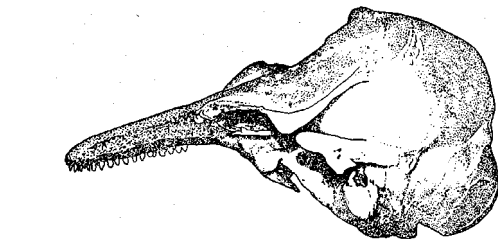
Tooth counts range from 13 to 22 in each tooth row.



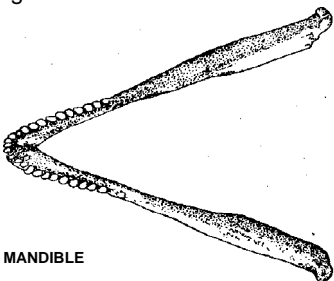
DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW



DORSAL VIEW OF MANDIBLE

Fig. 383 Skull

**Can be confused with:** The smooth back of the finless porpoise should make it easy to distinguish from other species, such as the Irrawaddy dolphin (p. 118), baiji (p. 200), and Ganges River dolphin (p. 194), which share parts of its range.

**Size:** Adults of this species reach about 1.9 m in length (males are slightly larger than females). Finless porpoises are apparently about 70 to 80 cm at birth.

**Geographical Distribution:** Warm, coastal Indo-Pacific waters, both fresh and marine, are home to the finless porpoise. The range runs from northern Japan to the Persian Gulf, including many rivers in the Asian subcontinent (one of the best known populations is in the Yangtze River of China).

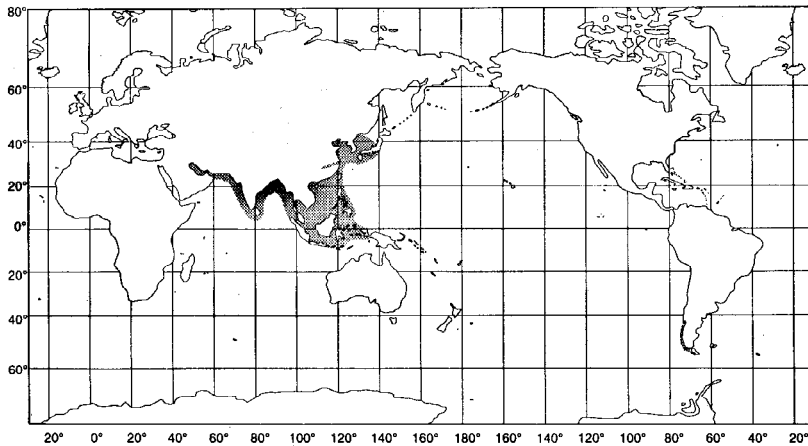


Fig. 384

**Biology and Behaviour:** Finless porpoises are generally found as singles, pairs, or in groups of up to 12, although aggregations of up to about 50 have been reported. Like other porpoises, their behaviour tends to be not as energetic and showy as that of dolphins. They do not ride bow waves, and in some areas appear to be shy of boats. Mothers have been seen carrying calves on the denticulated area on their backs. In the Yangtze River, finless porpoises are known to leap from the water and perform "tail stands."

Reproduction in most areas has not been well studied. Reports indicate that calving in the Yangtze River occurs between February and April, and in Japan it occurs between April and August.

Small fishes, squids, and shrimps form the diet of finless porpoises. They also apparently ingest some plant material, including leaves and rice.

**Exploitation:** Finless porpoises are known to be taken in various gillnet fisheries throughout their range, including the Yangtze River. They are also incidentally taken in beach seines in India. Direct exploitation with guns, harpoons, and "fish forks" used to occur in China, and previously some incidental catches were sold for human consumption in Japan. Pollution and habitat destruction may also be factors in the status of this species. Some porpoises have been captured live for aquariums in Japan.

**IUCN Status:** Insufficiently known.

***Platanista gangetica*** (Roxburgh, 1801)

PLAT Plat 1

GNS

**FAO Names:** En - Ganges River dolphin; Fr - Plataniste du Gange; Sp - Platanista del Ganges.

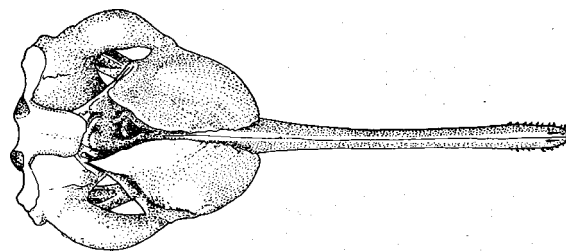


Fig. 385 *Platanista gangetica*

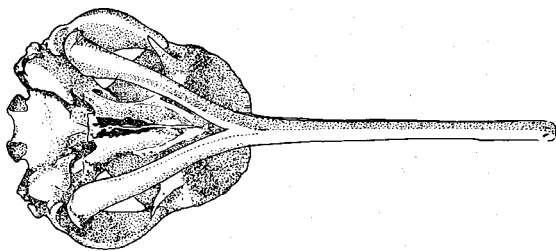
**Distinctive Characteristics:** The Ganges River dolphin, or susu, is a very strange-looking dolphin. The body is robust and soft, with a flexible neck, often characterized by a constriction or crease. The long beak is distinct from the steep forehead, but there is no crease between them. The beak is like a pair of forceps, is laterally compressed, and widens at the tip; it is proportionately longer in females than in males. The blowhole, unlike that of most cetaceans, is a slit that runs along the long axis of the animal's body. There is a shallow ridge on the melon, in front of the blowhole. The eyes are extremely small and are located above the distinctly upturned corners of the mouth. The dorsal fin is a very low and wide-based triangle about two-thirds of the way to the flukes, which are concave along the rear margin. The broad flippers usually have a flat trailing edge, but it is sometimes scalloped.

These animals are grey, often with a slightly darker dorsal surface. Some Ganges River dolphins may have a pinkish cast to the belly.

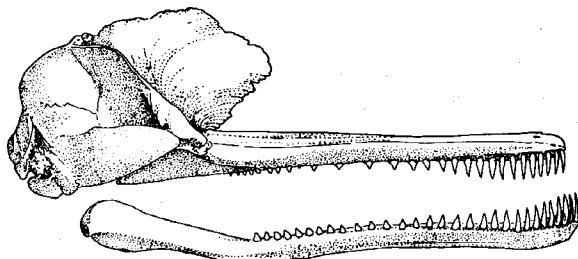
The 26 to 39 upper teeth and 26 to 35 lower teeth are curved. The anterior teeth are longer and extend outside of the closed mouth, especially in younger animals, whose teeth have not yet become worn.



DORSAL VIEW WITH MANDIBLE



VENTRAL VIEW WITH MANDIBLE



LATERAL VIEW

Fig. 386 Skull

**Can be confused with:** Ganges River dolphins can be confused with several other small cetaceans that are found in overlapping areas, mostly near the river mouth. Finless porpoises (p. 192) have no dorsal fin and no beak, Irrawaddy dolphins (p. 118) have no beak, and bottlenose (p. 154) and hump-backed (p. 134) dolphins are much larger and both have prominent dorsal fins that are very different from the low dorsal fin of the Ganges River dolphin.

**Size:** Female adults are up to 2.6 m and males 2.2 m in length. They can reach weights of at least 108 kg. Newborns are apparently between 65 and 90 cm.

**Geographical Distribution:** The extensive range of these dolphins includes the Ganges, Brahmaputra, and Karnaphuli river systems and many of their tributaries in India, Bangladesh, Nepal, and Bhutan. Ganges River dolphins live not only in the main channels, but also during the flood season, in seasonal tributaries, and the flooded lowlands.

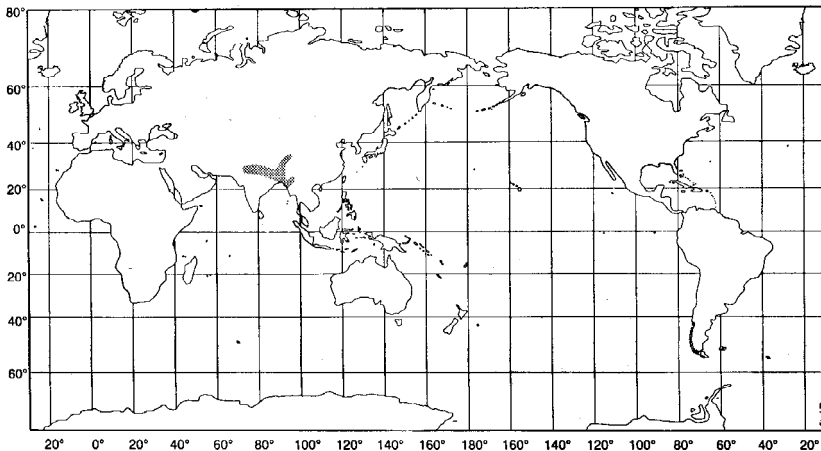


Fig. 387

**Biology and Behaviour:** As is true for most of the river dolphins, Ganges River dolphins generally live in small groups of less than 10 individuals, and are most often seen alone or in pairs. They are active animals, but they do not often engage in leaps. In captivity, these dolphins appear to spend much of their time swimming on their sides, and they constantly emit echolocation clicks. This is understandable in light of the fact that they normally live in relatively shallow, turbid waters. In fact, Ganges River dolphins are nearly blind, and can probably only detect light levels, and perhaps direction.

Calving apparently can occur at any time of the year, but there may be peaks in December to January and March to May.

These dolphins feed on several species of fishes, invertebrates, and possibly turtles and birds.

**Exploitation:** All river dolphins face the serious threat of loss of habitat, and the Ganges River dolphin is no exception. Damming and diversion of rivers, pollution of waters, increasing vessel traffic, overfishing of prey species, accidental catches in fishing gear, and direct hunting for meat and oil all threaten the existence of these animals. There are believed to be several thousand Ganges River dolphins left in the world.

**IUCN Status:** Vulnerable.



***Platanista minor*** Owen, 1853

PLAT Plat 2

BHU

FAO Names: En - Indus River dolphin; Fr - Plataniste de l'Indus; Sp - Platanista del Indus.

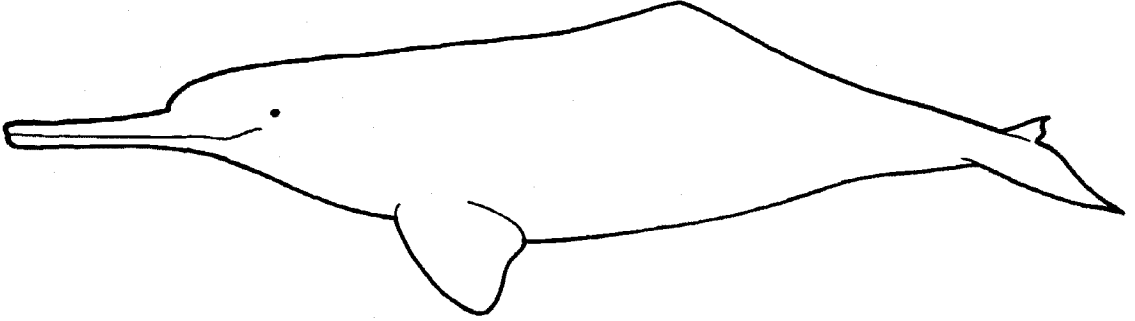
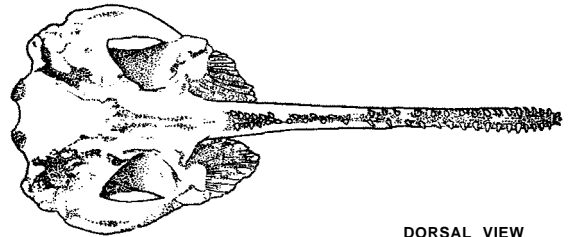
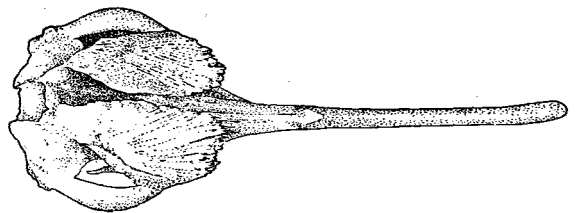


Fig. 388 *Platanista minor* (external appearance apparently identical to that of *P. gangetica*)

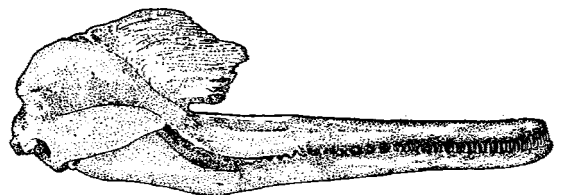
**Distinctive Characteristics:** Indus River dolphins, or bhulan, are almost identical in external appearance to Ganges River dolphins (p. 194). In fact, some researchers believe that the 2 types would be most appropriately classified as subspecies of *Platanista gangetica*. The most distinctive characteristics are the robust body, low dorsal fin, long beak, small eyes, longitudinal blowhole, and elongated front teeth.



DORSAL VIEW



VENTRAL VIEW



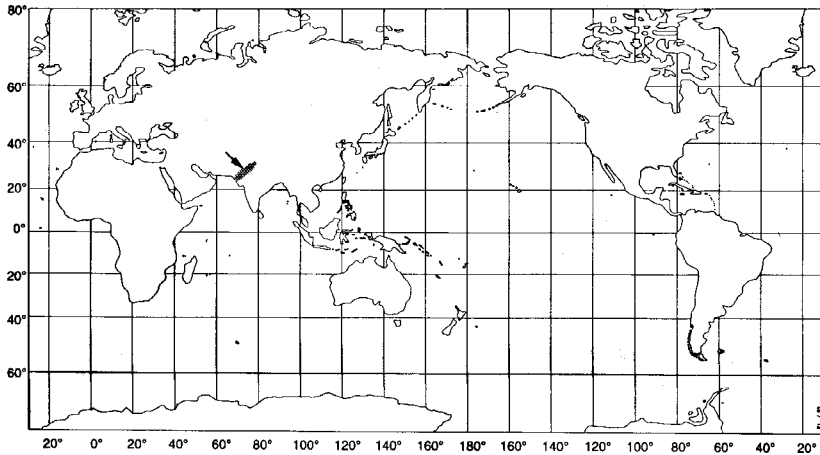
LATERAL VIEW

Fig. 389 Skull

**Can be confused with:** Although their ranges generally overlap only in a small portion of the lower Indus, Indus River dolphins might be confused with Irrawaddy dolphins (p. 118), finless porpoises (p. 192), bottlenose dolphins (p. 154), and Indo-Pacific hump-backed dolphins (p. 134). The dorsal fins of bottlenose and hump-backed dolphins, complete lack of a dorsal fin in finless porpoises, and absence of a beak in Irrawaddy dolphins should make them distinguishable. Also, bottlenose and hump-backed dolphins are much larger.

**Size:** Indus River dolphins probably grow slightly smaller than the maximum sizes of 2.6 m (females) and 2.2 m (males) for Ganges River dolphins. Length at birth is between 70 and 90 cm.

**Geographical Distribution:** Though formerly more widely distributed in the Indus and some of its tributaries, the range is now restricted to the middle and lower Indus River. It is centered between Jinnah and Kotri barrages.



**Fig. 390**

**Biology and Behaviour:** Although most commonly seen singly or in very small groups, Indus River dolphins have been reported in loose aggregations of up to 30 individuals. Like their relatives in the Ganges River, they often swim on their sides and appear to navigate mainly with the aid of echolocation.

There is almost nothing known of the reproductive biology of this species. Newborns have been observed in April and May.

Indus River dolphins feed on prawns and several species of fish. They may do much of their feeding on or near the bottom.

**Exploitation:** The Indus River dolphin is now extirpated in many parts of its former range. Both incidental and direct catches, as well as various forms of habitat destruction (including damming, diversion, and contamination of rivers) represent threats to the survival of the Indus River dolphin.

**IUCN Status:** Endangered.

*Inia geoffrensis* (de Blainville, 1817)

INI Inia 1 BOT

**FAO Names:** En - Boto; Fr - Inia; Sp - Bufo.  
(Note - boto is the Portuguese name used in Brazil, and has been adopted as the English common name.)

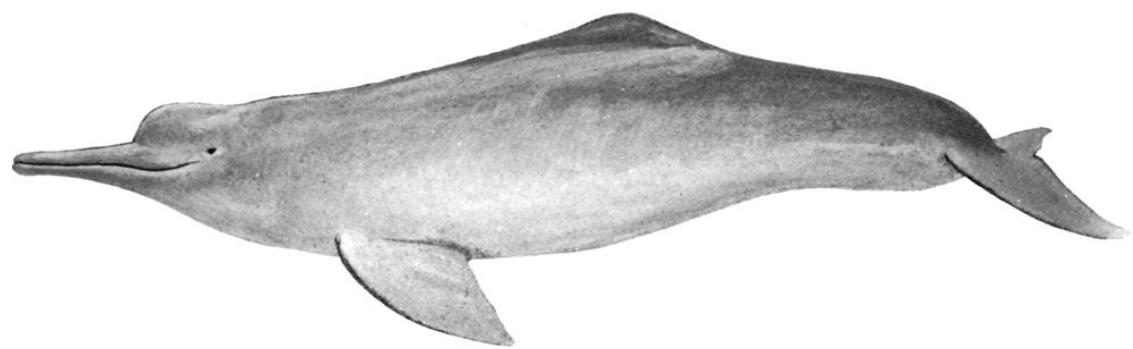
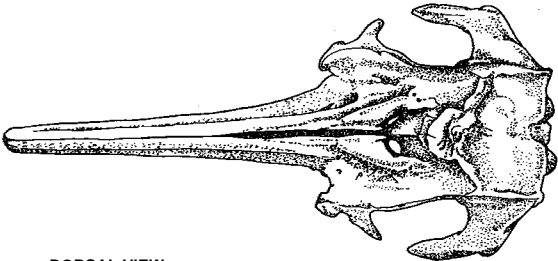


Fig. 391 *Inia geoffrensis*

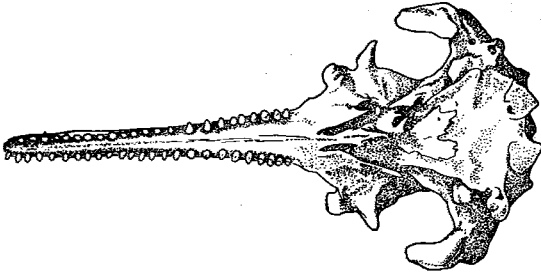
**Distinctive Characteristics:** The boto, or Amazon River dolphin, is probably the best-known of the river dolphins. These animals are moderately robust, and have long beaks and steep bulbous foreheads, which are capable of changing shape. There is no true dorsal fin, but only a dorsal ridge that is low and wide-based. The flippers are large and triangular, with blunt tips, and the flukes have a concave trailing edge that is often ragged. The eyes are small, but not as small as those of the Ganges River dolphin or Indus River dolphin.

Botos are grey to pink above and lighter below; some individuals are totally pink. In general, young animals are mostly uniform dark grey; they become progressively more pinkish with age. The extreme colour is so unique that the boto is often called the pink dolphin.

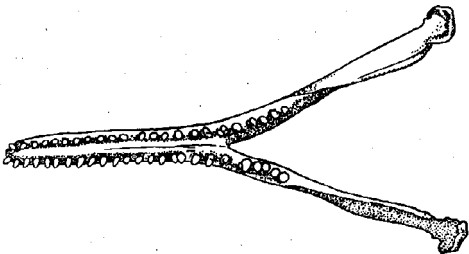
The mouth is lined with 23 to 35 stout teeth in each row. This is the only species of cetacean with differentiated teeth; those at the front of the jaw are typically conical, but those near the rear are flanged on the inside.



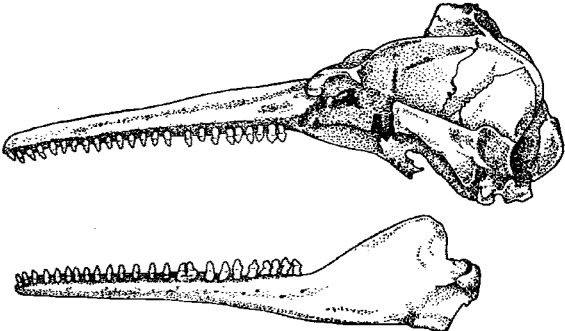
DORSAL VIEW



VENTRAL VIEW



DORSAL VIEW OF MANDIBLE



LATERAL VIEW

Fig. 392 Skull

**Can be confused with:** The only other dolphin that inhabits the range of the boto is *Sotalia* (p. 132). This latter species is much smaller, has a taller dorsal fin, and more spritely dolphin-like movements.

**Size:** Adult size ranges to 2.3 m (females) or 2.8 m (males). Males can reach maximum weights of 160 kg. At birth, boto are about 80 cm long.

**Geographical Distribution:** Boto are endemic to the Amazon and Orinoco drainage basins of South America. Their distribution extends to the upper reaches (impassible falls or rapids) of these rivers and their tributaries in Guyana, Colombia, Ecuador, Peru, and Bolivia, as well as the lower reaches in Brazil and Venezuela. They are found widely not only in the main river channels, but also in smaller tributaries, lakes, and (seasonally) the flooded forest.

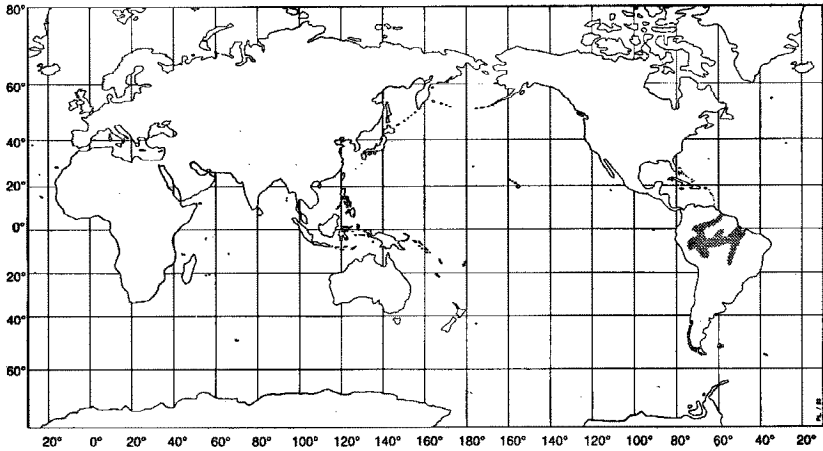


Fig. 393

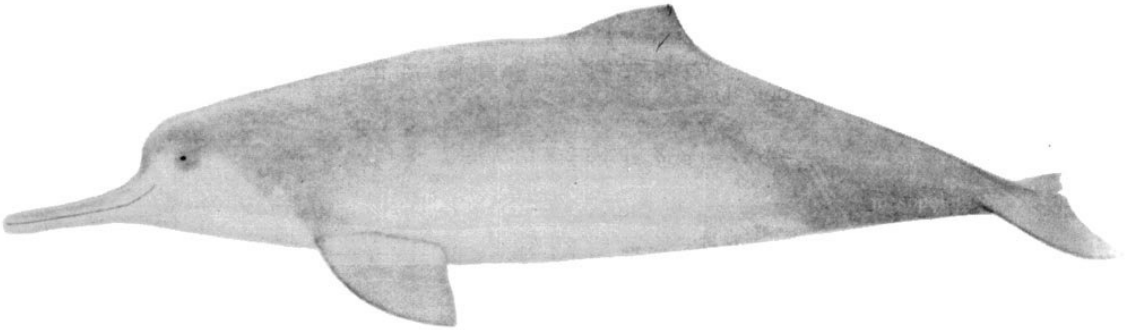
**Biology and Behaviour:** Groups of up to 12 to 15 have been observed, but most boto are seen singly or in small groups. They generally move slowly, and surface at a shallow angle, showing the top of the head and the dorsal ridge. Their responses to humans can range from shyness to curiosity.

In Brazil, births apparently occur in May to July, the season of peak flooding.

These animals feed on a large variety of fishes, generally near the bottom. Some of their prey have hard outer shells, and dolphins have been observed breaking up their larger prey before swallowing. They sometimes feed in a coordinated manner, occasionally with *Sotalia*.

**Exploitation:** Boto are threatened by various activities, among them are incidental catches in fisheries, damming of rivers associated with hydroelectric development, deforestation, and pollution from mercury mining operations. Significant numbers have been taken for the aquarium trade. Despite these problems, boto are still abundant in many parts of their range. Superstitions surrounding this species provide protection from hunting in many areas of its range.

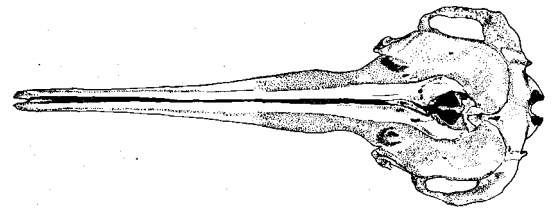
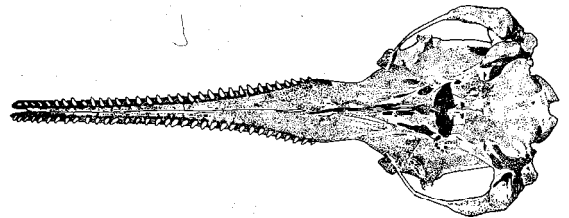
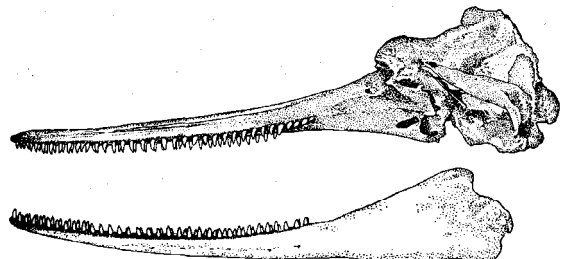
**IUCN Status:** Vulnerable.

***Lipotes vexillifer*** Miller, 1918**PONTO Lipo 1****BTI****FAO Names:** En - Baiji; Fr - Dauphin fluviatil de Chine; Sp - Platanista del Yangtze.**Fig. 394 *Lipotes vexillifer***

**Distinctive Characteristics:** Outside of China, very little was known of the baiji's biology until recently. These animals are moderately robust, with long, slightly upturned beaks, rounded melons, low triangular dorsal fins (set about two-thirds of the way back from the snout tip), and broad rounded flippers. The eyes are small, compared to those of oceanic dolphins, but not as small as those of *Platanista* sp.

Baiji, or Chinese river dolphins, are predominantly dark bluish grey above and light grey to white below. There are light brushings on the side of the face and the side of the tail stock.

Each tooth row contains 31 to 38 conical teeth.

**DORSAL VIEW****VENTRAL VIEW****LATERAL VIEW****Fig. 395 Skull**

**Can be confused with:** The only other small cetacean in the baiji's range is the finless porpoise (p. 192), which can be readily distinguished by its darker coloration and absence of a dorsal fin.

**Size:** Male baiji reach sizes of 2.3 m and 135 kg, and females reach 2.6 m and over 240 kg. Apparently, newborn baiji are less than 95 cm in length.

**Geographical Distribution:** The baiji is found only in the middle and lower reaches of the Yangtze River in China. Baiji may occasionally enter large lakes during intense flooding. The range was formerly broader.

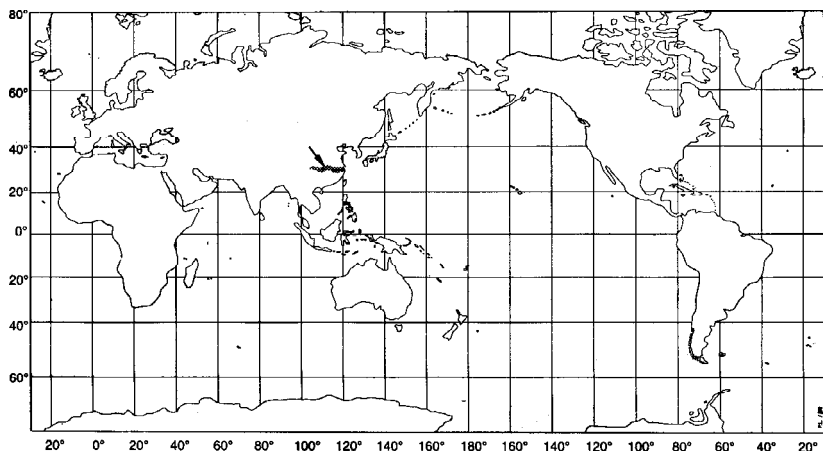


Fig. 396

**Biology and Behaviour:** Groups of 2 to 6 baiji are most commonly seen, but aggregations of up to 13 animals sometimes form. These dolphins are generally shy of boats, and their surfacings are shallow, often exposing only the top of the head, dorsal fin, and a small part of the back.

The peak calving season appears to be February to April.

A large variety of fish species make up the diet of the baiji.

**Exploitation:** With the possible exception of the vaquita, this is the most endangered of all cetaceans. The major source of mortality for baiji appears to be incidental catches in fishing gear, especially the so-called "rolling hooks" that are used to snag fish along the bottom of the Yangtze. Other threats include vessel collisions and disturbance, pollution, construction of dams, overfishing of prey species, and general modification of habitat through various human activities. Although China has declared the baiji a "Protected Animal of the First Order," there is still much uncertainty about the future of this species.

**IUCN Status:** Endangered.

***Pontoporia blainvillei*** (Gervais and d'orbigny, 1844)

PONTO Ponto 1

FRA

**FAO Names:** En - Franciscana; Fr - Dauphin de La Plata; Sp - Franciscana.



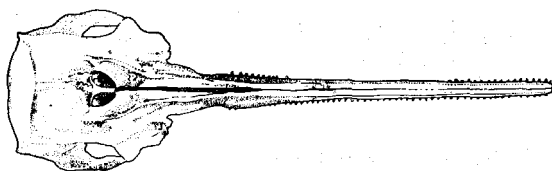
Fig. 397 *Pontoporia blainvillei*

**Distinctive Characteristics:** Although not a true freshwater dolphin, this primarily marine species is nonetheless related to them. The beak is extremely long and narrow, and the forehead is steep and rounded. The dorsal fin is low to moderately tall and triangular, with a rounded tip. The flippers are broad and spatulate, with an undulating trailing edge. In many subadults, there are visible ridges along the surface, corresponding to the flipper bones. In calves, the beak is much shorter and stouter than it is older animals.

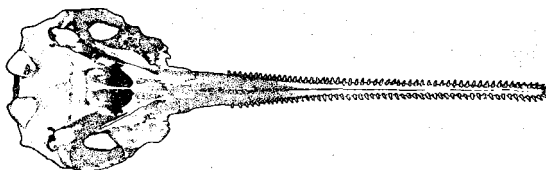
Franciscana are countershaded brownish to dark grey above, and lighter brown (or even yellowish) to grey below and on the lower flanks. A faint dorsal cape is present.

The long beak is lined with 50 to 62 fine pointed teeth per row, more than in nearly any other species of cetacean.

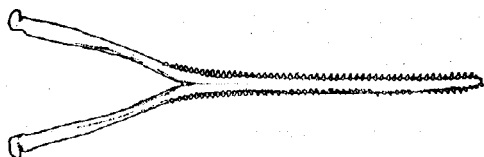
Recent morphological studies have documented the existence of 2 forms of franciscana, a smaller northern and a larger southern one.



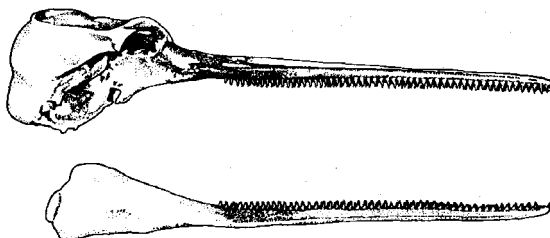
DORSAL VIEW



VENTRAL VIEW



DORSAL VIEW OF MANDIBLE



LATERAL VIEW

Fig. 398 Skull

**Can be confused with:** Young franciscana may be confused with marine dolphins of the genus *Sotalia* (p. 132), but can be identified by their very long beaks and more rounded dorsal fins.

**Size:** Males reach 1.63 m, and females 1.77 m in length. Maximum recorded weight is about 34 kg. At birth, franciscana average about 75 cm.

**Geographical Distribution:** Franciscana are found only along the east coast of South America, from central Argentina to central Brazil. They are primarily coastal, but may be found in some estuaries, and sporadically enter the la Plata River.

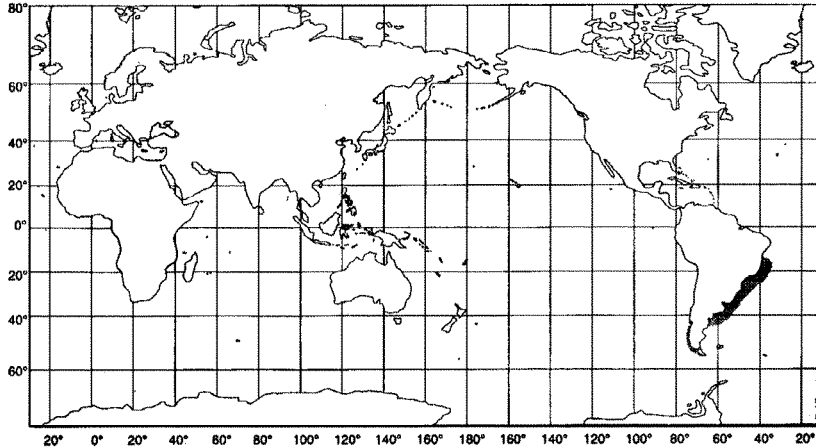


Fig. 399

**Biology and Behaviour:** There is very little known about the franciscana's natural history. They are found in small groups of up to 5 individuals. In general, they appear to avoid vessels.

Peak calving for this species is in November and December.

Franciscana feed mostly near the bottom on several species of fish, cephalopods, and crustaceans.

**Exploitation:** Although there are no estimates of abundance, the franciscana is not thought to be in serious danger of extinction. Because they do not live in rivers, these animals are not as burdened with some the threats facing other members of the family. However, incidental catches, mostly of juveniles, in gillnets for sharks and other species of fish are a serious problem. Some commerce in parts from accidentally caught dolphins has been documented. Other environmental problems include pollution of habitat, the effects of vessel traffic, and environmental contaminants.

**IUCN Status:** Insufficiently known.



3. ORDER SIRENIA - Manatees and Dugongs

SIRENIA

There are 4 living species of sirenians, 3 manatees and the dugong. A fifth species, Steller's sea cow, of the North Pacific and Bering Sea, was exterminated by overhunting in the 1700's. Sirenians, like cetaceans, are totally aquatic. They are the only herbivorous marine mammals. As a consequence, they tend to be less marine than members of other marine mammal groups. In fact, manatees spend much or all of their lives in fresh or brackish water. All 4 living species are restricted to a tropical and subtropical habitat; Steller's sea cow was unique: it inhabited cold temperate to subarctic waters.

Sirenians have the following morphological characteristics in common: robust body; tough, thick skin with little hair; two nostrils on top or at the front of a thick muzzle; no ear pinnae; no hind limbs; mammary nipples located near the axillae; forelimbs modified into flippers; horizontally flattened tail; and dense, swollen bones.

3.1 Key to the Sirenians of the World

- 1a. Tail split into flukes, with a median notch; tail stock laterally compressed: nostrils on top of snout; incisors (tusks) present; distribution limited to the Indo-Pacific region (Fig. 400) . . . . . **Dugong (*Dugong dugon*) p. 212**
- 1b. Tail rounded and paddle-like; tail stock not laterally compressed; nostrils at front of snout; incisors not present in adults; distribution limited to Atlantic Ocean and surrounding waters . . . . . **(Manatee) → 2**



Fig. 400 *Dugong dugon*

- 2a. No nails on flippers; skin of older individuals unwrinkled; light patches on belly and chest; maximum length 3 m; distribution limited to Amazon River and its tributaries (Fig. 401) . . . . . **Amazonian manatee (*Trichechus inunguis*) p. 208**
- 2b. Nails present on flippers; skin wrinkled; generally, no light ventral patches: occurrence near the Amazon River limited to vicinity of mouth (Figs 402 and 403) . . . . . **(West Indian or West African manatee) → 3**

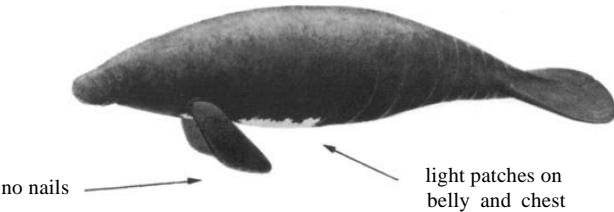


Fig. 401 *Trichechus inunguis*

- 3a. Distribution limited to coastal and inland waters of West Africa (Fig. 402) . . . . . West African manatee (*Trichechus senegalensis*) p. 210
- 3b. Distribution limited to waters of the southeastern United States, Gulf of Mexico, Caribbean Sea, and northeastern coast of South America (Fig. 403) . . . . . West Indian manatee (*Trichechus manatus*) p. 206

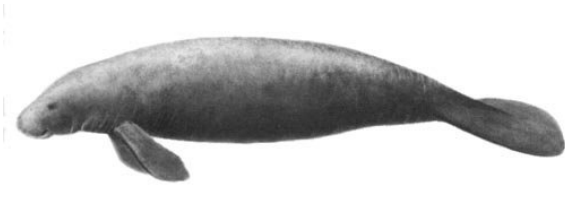


Fig. 402 *Trichechus senegalensis*

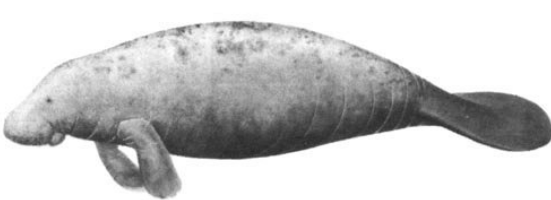


Fig. 403 *Trichechus manatus*

3.2 Guide to Families of Sirenians

TRICHECHIDAE

Manatees are found in tropical and subtropical areas and are very sensitive to cold. They are characterized by a horizontally flattened, rounded tail (as opposed to the whale-like flukes of dugongs). With only 6 cervical vertebrae, manatees are among the few groups of mammals that diverge from the normal mammalian number of 7. They are also unique in that their teeth are replaced throughout life with new ones from the rear of the mouth.

Manatees (3 species in 1 genus) p. 206

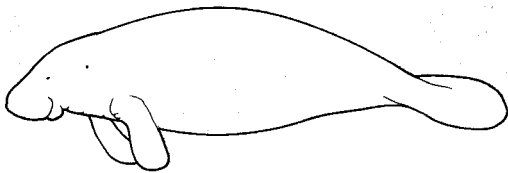


Fig. 404 Trichechidae

DUGONGIDAE

There is only 1 living species in the family Dugongidae. The other recent member, Steller's sea cow (*Hydrodamalis gigas*), has been extinct since 1768. The dugong is tropical and subtropical, but Steller's sea cow was an inhabitant of cold temperate to subarctic waters. In members of this family, the flattened tail is expanded into flukes, similar to those of cetaceans. Other characteristics include a rostrum that is deflected downwards, the presence of erupted tusks in males (dugong only; Steller's sea cow had no teeth), a more streamlined body than those of manatees, and the absence of nails on the flippers.

Dugong (1 living species in 1 genus) p. 212



Fig. 405 Dugongidae

### 3.3 FAO Species Identification Sheets

***Trichechus manatus*** Linnaeus, 1758

TRIC Tric 1

WIM

**FAO Names:** En - West Indian manatee; Fr - Lamantin des Caraïbes; Sp - Vaca marina del Caribe.

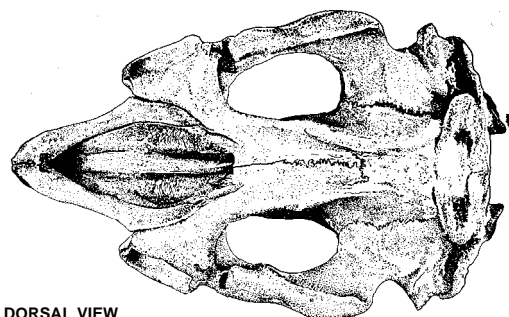


**Fig. 406 *Trichechus manatus***

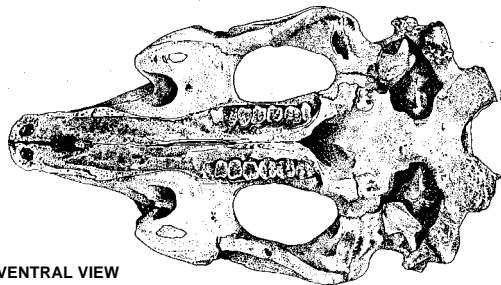
**Distinctive Characteristics:** West Indian manatees are rotund and have long flexible forelimbs and rounded, paddle-like tails. The head is small, with no discernible neck, and the body exhibits numerous folds and fine wrinkles. The squarish, thickened snout has fleshy mobile lips (with stout bristles on the upper lip) and 2 semi-circular nostrils at the front. The skin has fine hairs sparsely distributed over its surface. Each flipper has 3 or 4 fingernails at the tip. The tail stock is not laterally compressed into a peduncle.

The colour of the skin is generally grey to brown, often with a green tinge caused by algal growth. The short hairs are colourless. Calves appear to be a darker shade of grey, almost black.

There are 5 to 7 pairs of bicuspid post-canines in each jaw. When forward teeth are worn or lost, they are replaced from behind. At birth, each jaw also has 2 vestigial incisors, which are lost as the animal ages.



**DORSAL VIEW**



**VENTRAL VIEW**



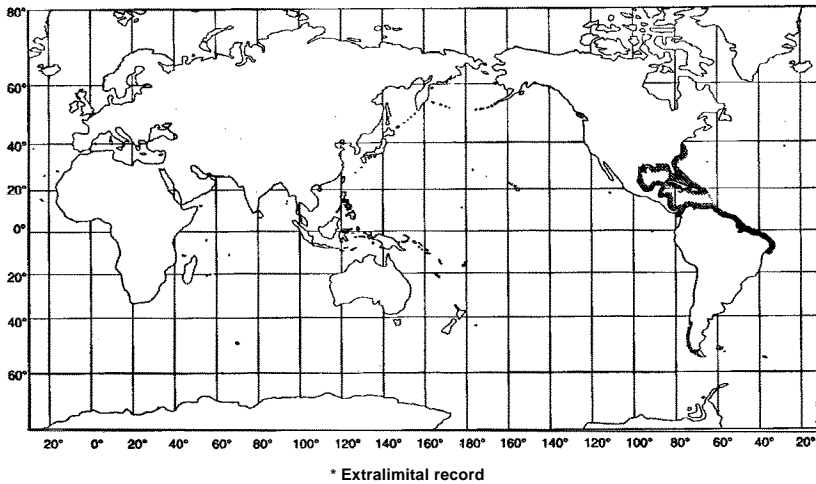
**LATERAL VIEW WITH MANDIBLE**

**Fig. 407 Skull**

**Can be confused with:** The West Indian manatee is the only sirenian throughout its range, with the possible exception of the area around the mouth of the Amazon River. In this region, Amazonian manatees (p. 208) can be distinguished by their smaller size, more slender body, smooth skin, lack of nails on the flippers, and their tendency to have light belly and chest patches.

**Size:** Most adults are up to 3.5 m (3.9 m maximum) long and weigh up to 1 590 kg. Newborns measure about 120 cm and weigh about 30 kg.

**Geographical Distribution:** West Indian manatees are found in coastal marine, brackish, and freshwater areas of the tropical and subtropical southeastern United States, Gulf of Mexico, Caribbean Sea, and Atlantic coast of northeastern South America. There are 2 subspecies: the Florida manatee (*T. m. latirostris*) from Louisiana to Virginia in the northern Gulf of Mexico and southeast United States, and the Antillean manatee (*T. m. manatus*) from northern Mexico to central Brazil and the islands of the Caribbean. Recently, a few manatees transplanted into the Panama Canal may have passed through the locks and made it to the Pacific side.



**Fig. 408**

**Biology and Behaviour:** Manatees are slow-moving and lethargic; they are seen mostly alone or in groups of up to 6. Larger groups are occasionally seen. For instance, during cold weather, large aggregations assemble near sources of warm water (such as power plant outfalls) in Florida.

West Indian manatees breed throughout the year, with a peak, at least in Florida, in the spring and summer. Generally, a single calf is born after a gestation period of at least 12 months.

These animals are vegetarians, feeding on aquatic plants, such as water hyacinths and marine seagrasses. At times in some areas, they also eat algae, parts of mangrove trees, floating and shoreline vegetation, invertebrates such as tunicates, and fish they remove from fishing nets.

**Exploitation:** West Indian manatees are endangered. Heavy hunting pressure in the past has reduced the population considerably. Currently, human-induced problems, especially loss of habitat from unchecked development and death or injury from collisions with fast-moving boats, eminently threaten this species with extinction.

**IUCN Status:** Vulnerable.

***Trichechus inunguis*** Natterer, 1883

TRIC Tric 3

SEW

**FAO Names:** En - Amazonian manatee; Fr - Lamantin de l'Amazonie; Sp - Vaca marina del Amazon.

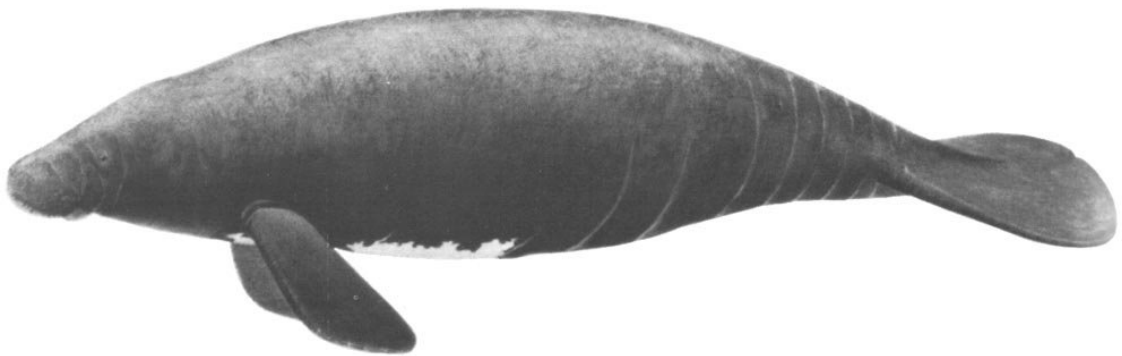
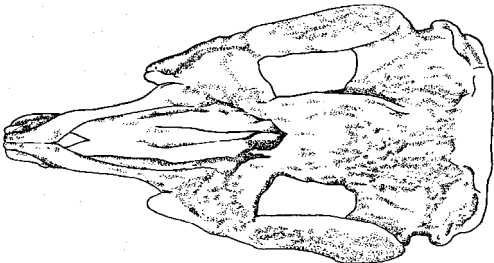


Fig. 409 *Trichechus inunguis*

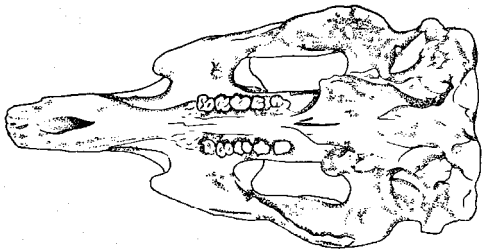
**Distinctive Characteristics:** Amazonian manatees are the smallest, most slender of the 3 species of manatees. They have the rounded tails characteristic of manatees, but the skin of adults and juveniles is smooth, rather than wrinkled as in their relatives. The large flippers lack nails. There are thick bristles on the lip pads of both jaws, and the body has a sparse covering of fine hairs.

Amazonian manatees are grey to black; most have white or pink belly and chest patches (these only rarely occur in Florida manatees).

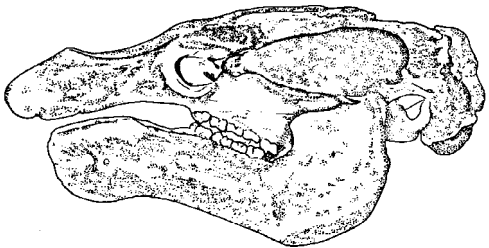
Five to 7 functional cheek teeth, and 2 vestigial incisors (resorbed after birth) are found in each tooth row. Typical of manatees, teeth are replaced from the rear. They are smaller than in other manatee species.



DORSAL VIEW



VENTRAL VIEW



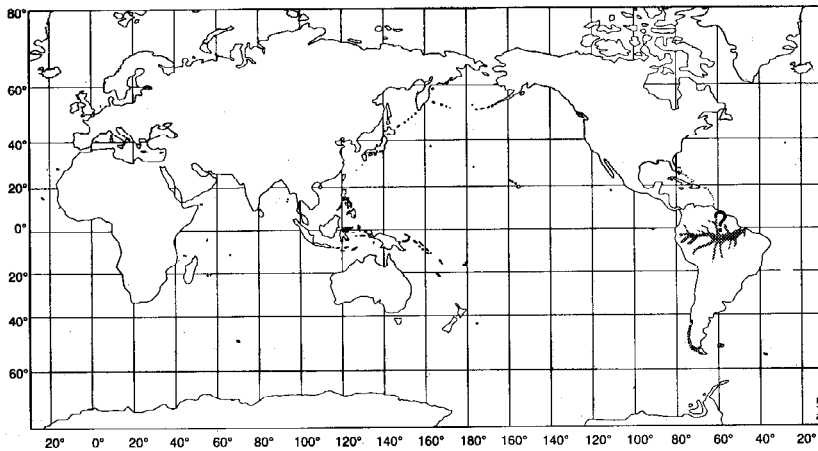
LATERAL VIEW WITH MANDIBLE

Fig. 410 Skull

**Can be confused with:** Amazonian and West Indian manatees (p. 206) may co-occur in or near the mouth of the Amazon River. The size, shape, and coloration differences listed above will help in allowing them to be distinguished. Also, the presence (West Indian) or absence (Amazonian) of nails on the flippers is diagnostic, when seen.

**Size:** Amazonian manatees reach lengths of only about 3.0 m, and weights of at least 450 kg. Length at birth is about 90 cm; weight is 10 to 15 kg.

**Geographical Distribution:** This is a freshwater species. Amazonian manatees are found in waters of the Amazon River and its tributaries in Brazil, Guyana, Colombia, Peru, and Ecuador. They may possibly occur in the Orinoco drainage as well.



**Biology and Behaviour:** The poorly known Amazonian manatee occurs singly or in feeding groups of up to 8 individuals. The large herds often seen in the past are a rarity today. Their activities are strongly influenced by the seasonal floods. Their behaviour is very cryptic.

Breeding occurs throughout much of the year, but there is a peak in February to May, when the water level in the river rises. A single calf is born after a gestation of about a year.

Amazonian manatees feed on vascular aquatic and semi-aquatic plants, but they have also been observed to eat floating palm fruits. Some may fast or eat dead plant material during the dry season.

**Exploitation:** Heavy hunting for meat, hides, and oil in the 17th to mid-20th century has left the species depleted in many areas. Subsistence hunting continues to pose a threat, and damming of tributaries and other forms of habitat destruction create other problems.

**IUCN Status:** Vulnerable.

***Trichechus senegalensis*** Link, 1795

TRIC Tric 2

WAM

**FAO Names:** En - West African manatee; Fr - Lamantin d'Afrique; Sp - Vaca marina del Africa.

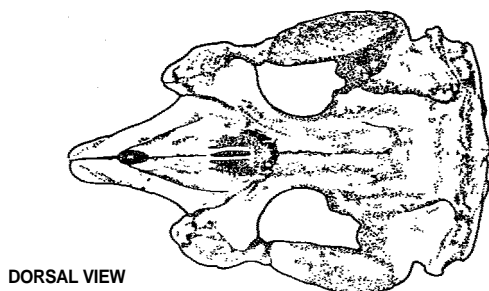


**Fig. 412 *Trichechus senegalensis***

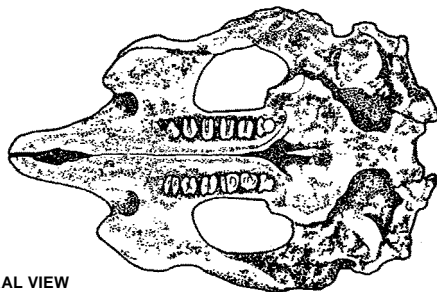
**Distinctive Characteristics:** West African manatees are very similar in appearance to West Indian manatees (p. 206), although they are more slender. They have rounded, paddle-like tails. The head shape is similar to that of the West Indian manatee, but the snout is blunter, and the small eyes stick out more. There are stiff bristles on the lips. As in other manatees, the flippers are paddle-like; and there are nails on the upper surface. The skin is wrinkled, with a sparse covering of short hairs.

The body of West African manatees is greyish brown; and the hairs are white.

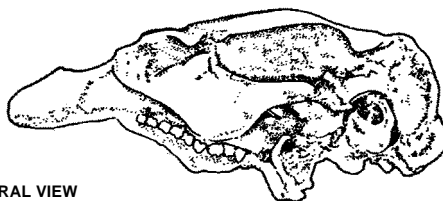
There are 5 to 7 functional teeth in each tooth row. These are replaced from the rear by newly erupting teeth. Newborn animals have 2 vestigial incisors, which are later lost.



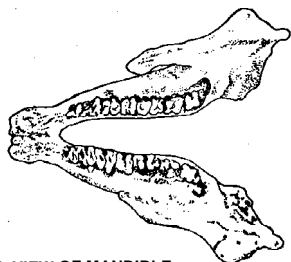
**DORSAL VIEW**



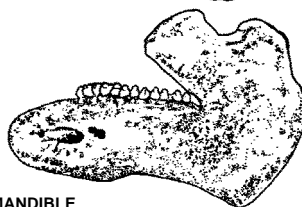
**VENTRAL VIEW**



**LATERAL VIEW**



**DORSAL VIEW OF MANDIBLE**



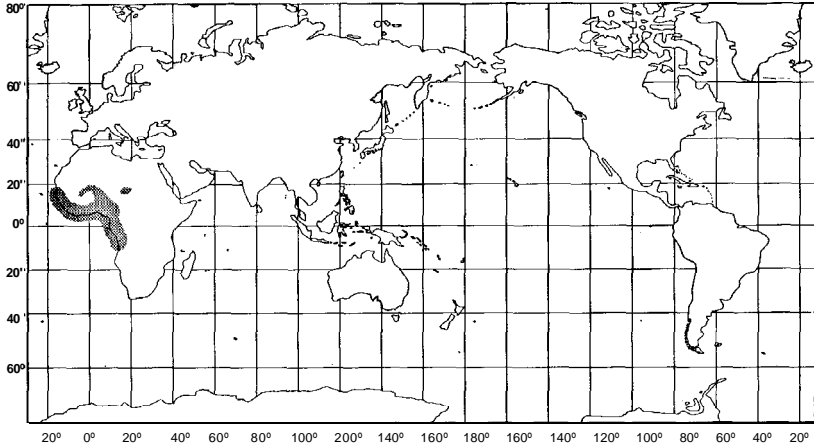
**LATERAL VIEW OF MANDIBLE**

**Fig. 413 Skull**

**Can be confused with:** West African manatees will be easy to identify, as they are the only sirenians in their range.

**Size:** Adult West African manatees reach 3 to 4 m in length and up to 750 kg in Weight. Newborns are about 1 m long.

**Geographical Distribution:** West African manatees are found in coastal marine waters, rivers, and estuaries from southern Mauritania to northern Angola. There are also some unverified reports of manatees in Lake Chad, and nearby rivers.



**Fig. 414**

**Biology and Behaviour:** Manatees are mostly solitary, but mothers and calves are found together and aggregations of up to 15 form for feeding and other purposes. There is little else known of their behaviour.

There is some breeding year-round, but there appears to be some seasonality related to the rains. A single calf is born, generally in shallow lagoons.

Aquatic vascular plants comprise much of the diet of West African manatees. They may also feed on mangrove leaves or plants on the banks of rivers or channels. Clams have been found in the stomachs of some animals. In Senegal, they reportedly eat small fish from fishermen's nets.

**Exploitation:** West African manatees are hunted for meat, skin, bones, and oil by local people. Other problems are damming of rivers, navigation channel development, and accidental capture in fishing gear.

**IUCN Status:** Vulnerable.



***Dugong dugon*** (Müller, 1776)

DUGO Dugo 1

DUG

FAO Names: En - Dugong; Fr - Dugong; Sp - Dugón.



Fig. 415 *Dugong dugon*

**Distinctive Characteristics:** The dugong is unique among living sirenians in having whale-like flukes with a median notch, instead of the rounded tails of manatees. In general, dugongs are more streamlined and cetacean-like than manatees. The area in front of the flukes is laterally compressed into a peduncle. The paddle-shaped flippers have no nails. There is a downward deflection to the muzzle, which ends in a “rostral disk” with short, dense bristles. The nostrils are valve-like and are situated on the top of the animal’s snout. The skin is generally smooth (not wrinkled, although there are folds) and is sprinkled with short hairs.

Adults are slate grey on the back, slightly lighter on the belly. Calves are a pale cream colour.

The dental formula is I 2/3, C 0/1, PM 3/3, M 3/3 (the 6 molars and premolars are reduced to 2 or 3 in older animals). The lower incisors and canines, and the inner pair of upper incisors, are vestigial.

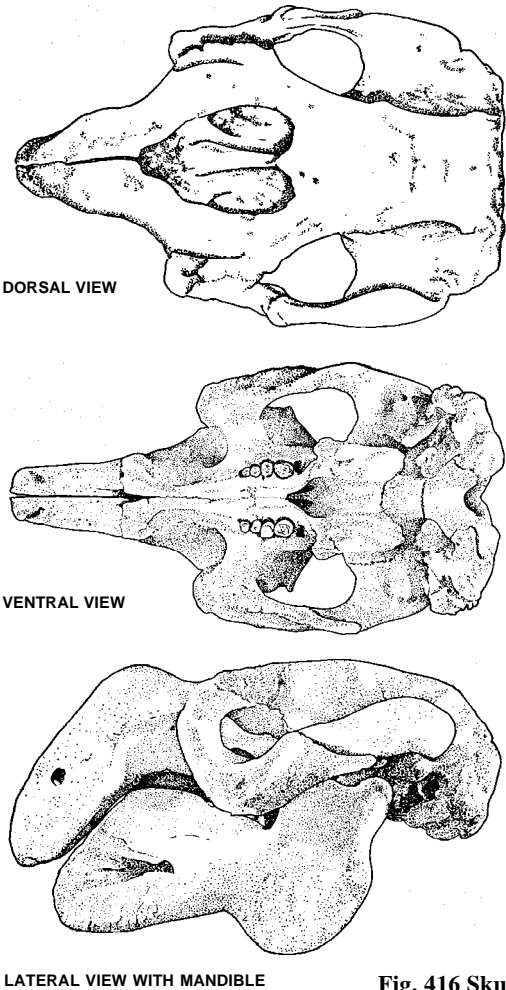


Fig. 416 Skull

**Can be confused with:** This is the only sirenian in the Indo-Pacific. There is some possibility of confusion with the finless porpoise (p. 192), but the single blowhole of the porpoise and the double nostrils of the dugong will allow them to be easily distinguished.

**Size:** Maximum known size for dugongs is about 3.3 m and at least 400 kg (a specimen reported to be 4.06 m and 1 016 kg is considered to be an error). At birth, dugongs are between 1 and 1.5 m long and weigh about 20 kg.

**Geographical Distribution:** Dugongs are widely distributed in the Indo-Pacific region in coastal tropical and subtropical waters. They also occur in inshore waters, in bays and channels. The range is discontinuous: from southeast Africa north to the Red Sea; in the Persian Gulf; along western India to Sri Lanka; and throughout Indonesia and the Pacific islands, to the Ryukyu Islands in the north and the central coasts of Australia in the south.

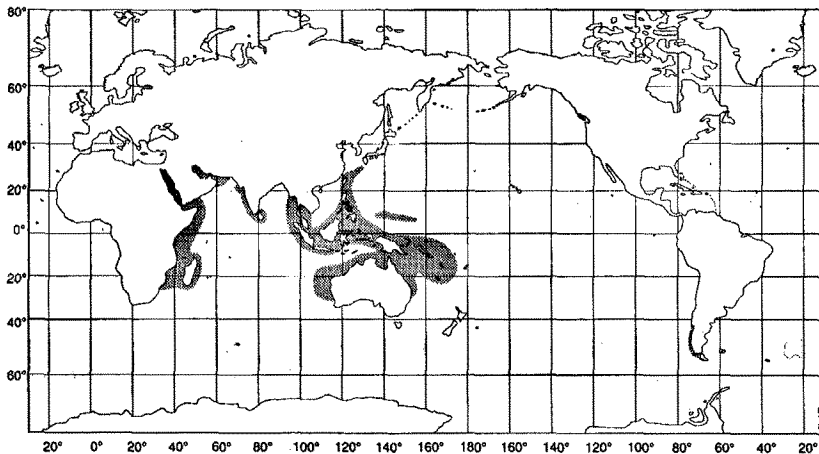


Fig. 417

**Biology and Behaviour:** Dugongs occur mostly in small groups of up to 6 individuals. Herds as large as several hundred animals periodically form, although not as often as in the past. Dives up to 8 minutes have been recorded.

There is some reproductive activity throughout most of the year, with calving peaks in June to September in at least some parts of the range. Not much is known about reproductive behaviour in the dugong, but groups of males seem to compete to mate with a single estrus female. The gestation period is about 13 to 14 months, and a single calf is born.

The food of dugongs consists of various types of bottom vegetation, primarily seagrasses. Feeding trails in seagrass beds can be seen in dugong feeding areas exposed by the tides.

**Exploitation:** There is subsistence and commercial hunting of dugongs in many areas. Destruction of seagrass beds and pollution also pose a threat to this species. They have been extirpated in some parts of their range; in others, they are still abundant.

**IUCN Status:** Vulnerable.

4. ORDER CARNIVORA - Pinnipeds and other Marine Carnivores

CARNIVORA

4.1 SUBORDER PINNIPEDIA - Seals, Sea lions, and Walruses

PINNIPEDIA

There are 34 species of pinnipeds (Suborder Pinnipedia), all of which are assigned to 3 families of the mammalian order Carnivora: the Otariidae, Phocidae and Odobenidae. The otariids are the 14 species of sea lions and fur seals, sometimes referred to as the eared or walking seals. The phocids are the 19 species of true seals, sometimes referred to as the earless true, or crawling seals. Odobenids are reduced to just a single living species, the walrus. There is controversy as to whether the pinnipeds are monophyletic (i.e., evolved from a single ancestor) or biphyletic (from 2 separate ancestors).

Pinnipeds are highly specialized aquatic carnivores that live in a diversity of marine habitats, and some freshwater ones as well. One unifying feature of the group is that all must return to a solid substrate, such as land or ice, to bear their pups. Females give birth to a single offspring per reproductive effort. Twins are extremely rare in all species. All species are amphibious, though the otariids are the most agile and mobile on land. In general, phocids are more capable divers and breath-holders, although there is overlap in the capabilities of some otariids and phocids. Some species spend considerable amount of time in the water, only coming ashore to breed or give birth.

Pinnipeds all have fur (but also use blubber for thermoregulation), 2 sets of limbs (called foreflippers and hindflippers), long whiskers, nasal openings at the tip of the snout, and reduced or lost ear flaps. Pinnipeds moult every year, some gradually over several weeks or months, others dramatically in a short time. In most species pups are born in a lanugo coat which differ from juvenile or adult pelage in colour and length. In the species accounts below, pinniped coloration is described in more detail than for cetaceans, because for identification, there is often more of an emphasis on the subtle shading often visible on hauled-out pinnipeds.

4.1 .1 Key to Identification of Pinnipeds of the World

- 1a. Tail attached to body by web of skin: muzzle very short and broad with a flat end; nearly all vibrissae on the end (as opposed to the sides) of the muzzle; 2 massive upper canine teeth enlarged to form tusks that project up to 1 m out of the mouth (except in infants, or when broken off or worn in adults); only 3 post-canine teeth in each tooth row (Fig. 418) . . . . . **Walrus (*Odobenus rosmarus*) p. 256**
- 1b. Short free tail; muzzle generally tapering and somewhat pointed; nearly all vibrissae on the sides of the muzzle; upper canines never enlarged to form tusks that project out of the mouth; 5 to 6 post-canines in each row. . . . . → 2



Fig. 418 *Odobenus rosmarus*

- 2a. External ear pinnae present: all flippers incompletely furred, with only a sparse growth of short hair on top; claws on foreflippers vestigial or absent; 3 claws on each hindflipper on the 3 central digits; long terminal flaps beyond the claws on the digits of the hindflippers; hindflippers can rotate under the body (permitting walking); skin light in colour; first 2 upper incisors with transverse grooves (Fig. 419) .... (Fur seal or sea lion) → 3
- 2b. No external ear pinnae; all flippers completely furred on top and bottom; 5 usually prominent (except in *Hydrurga* and *Ommatophoca*, in which they are small) claws, 1 on each digit of both foreflippers; hindflippers cannot be rotated under the body (thus cannot walk on land); 5 or no claws visible near the end of each digit on the hindflippers; no long flaps of skin beyond claws on hindflipper digits: skin dark in colour; upper incisors not grooved transversely (Fig. 420) ..... (True seal) → 16

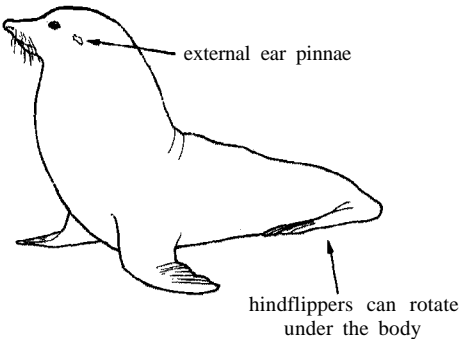


Fig. 419 Eared seal

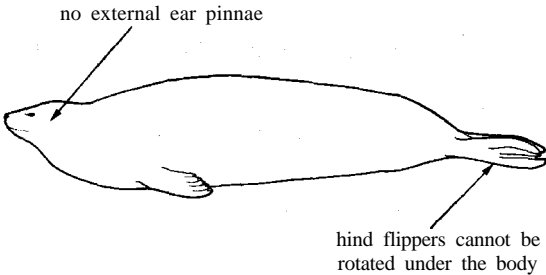


Fig. 420 True seal

- 3a. Dense underfur present: guard hairs (outer visible fur) long, giving a thick woolly appearance; terminal flaps on hindflipper digits all approximately equal in length and shape; relatively long prominent ear pinnae (Fig. 421) ..... (Fur seal) → 4
- 3b. Fur short and stiff, except for the mane of males of some species; hindflipper digits unequal in length, with the hallux and the 5th digit longer (the hallux is longer and wider) than digits 2 to 4; ear pinnae relatively short and lying close alongside head (Fig. 422) ..... (Sea lion) → 12

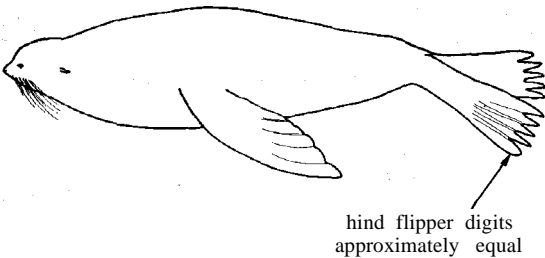


Fig. 421 Fur seal

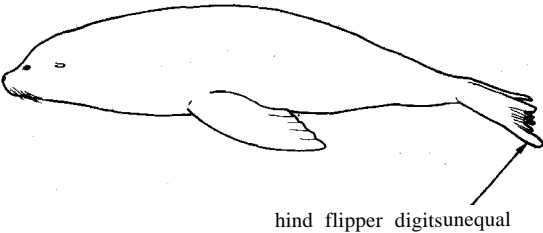


Fig. 422 Sea lion

- 4a. Fur on the foreflippers stops abruptly at the wrist, with the top of the foreflippers entirely naked; hindflippers long, about one-fourth standard length; very long terminal flaps beyond the claws on the hindflippers; muzzle very short; distribution limited to North Pacific and adjacent seas (Fig. 423) . . . . .**Northern fur seal (*Callorhinus ursinus*)** p. 238
- 4b. Fur on top of hindflippers beyond the wrist (bend point when the animal is sitting upright): hindflippers about one-fifth of standard length; terminal flaps beyond the claws on the hindflippers moderate in length; muzzle relatively long; distribution limited to Southern Hemisphere and warm temperate eastern North Pacific (The “southern fur seals” [genus *Arctocephalus*] are all very similar in appearance, and only a few species have unique features that permit identification based on external characteristics. Also, some species [i.e. *A. gazella* and *A. tropicalis*] are known to hybridize. Adult females and sub-adult “southern fur seals” may not be seperable based on external appearence. Skulls may be required to positively identify some species and separate them from related forms.) (Fig. 424) . . . . .**(“Southern fur seal”)** → 5

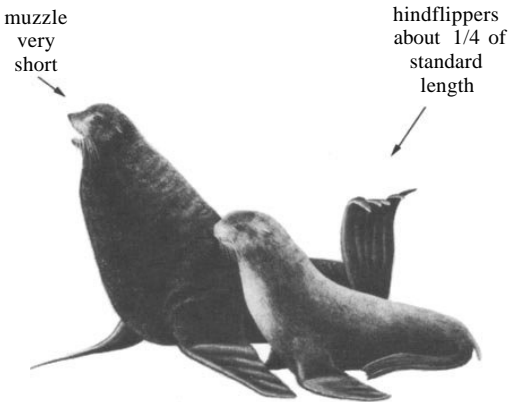


Fig. 423 *Callorhinus ursinus*

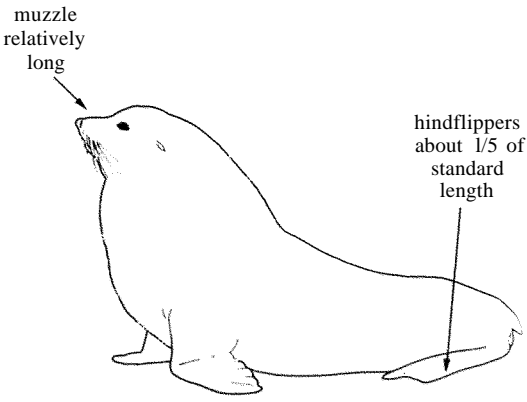


Fig. 424 “Southern fur seals”

- 5a. Muzzle short, with somewhat flattened end creating a pug appearance (Fig. 425). . . . .→ 6
- 5b. Muzzle moderate to long (may not be possible to distinguish from 5a for females and subadults) (Fig. 426) . . . . .→ 8

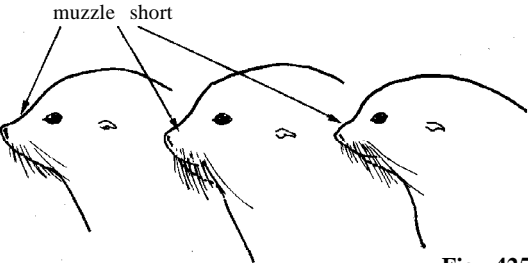


Fig. 425

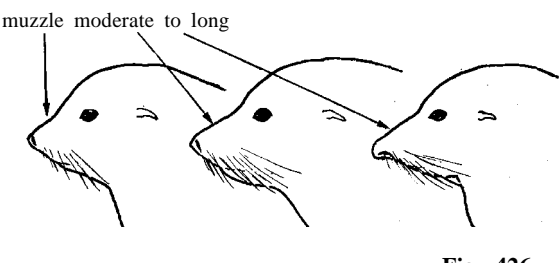


Fig. 426

- 6a. Adults with yellowish to orangish upper chest, neck, and face (to over the eyes); prominent crest of longer guard hairs on crown just behind the eyes (Fig. 427) .....  
..... **Subantarctic fur seal (*Arctocephalus tropicalis*)** p. 250
- 6b. Adults with moderate to no contrast in coloration on upper chest, neck, and face .....→ 7



Fig. 427 *Arctocephalus tropicalis*

- 7a. Adults medium-sized; silver grey with frosted guard hair tips; distribution antarctic and subantarctic only (Fig. 428)..... **Antarctic fur seal (*Arctocephalus gazella*)** p. 252
- 7b. Adults very small; generally minimal frosting on tips of guard hairs (if present usually not silver-grey); distribution confined to Galapagos Archipelago (Fig. 429) .....  
..... **Galapagos fur seal (*Arctocephalus galapagoensis*)** p. 244



Fig. 428 *Arctocephalus gazella*



Fig. 429 *Arctocephalus galapagoensis*

- 8a. Large bulbous nose; downward-facing nostrils (adult males) (Fig. 430) .....→ 9
- 8b. Small to moderate nose (specifically the end of the muzzle, and not overall muzzle length); nostrils facing ahead (Fig. 431) ..... →10

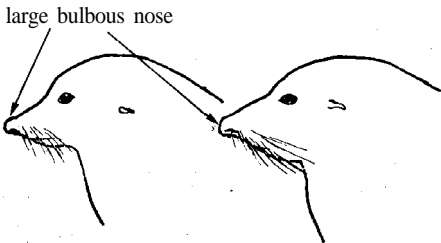


Fig. 430

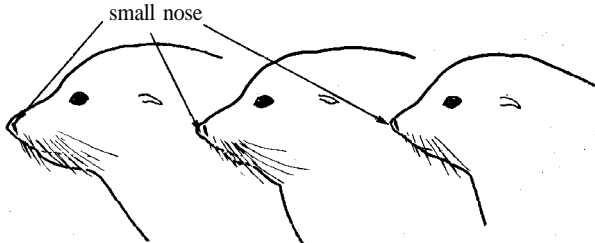


Fig. 431

- 9a. Distribution confined to area around Juan Fernandez Archipelago, off the coast of Chile (Fig. 432) ..... **Juan Fernandez fur seal (*Arctocephalus philippii*)** p. 242
- 9b. Distribution confined to eastern North Pacific, from about Guadalupe Island north to central California (Fig. 433) ..... **Guadalupe fur seal (*Arctocephalus townsendi*)** p. 240



Fig. 432 *Arctocephalus philippii*



Fig. 433 *Arctocephalus townsendi*

- 10a. Distribution confined to coastal South America, from Peru, south to Cape Horn, and north to Brazil and the Falkland Islands (Fig. 434) ..... **South American fur seal (*Arctocephalus australis*)** p. 246
- 10b. Distribution limited to either New Zealand, southern Australia and adjacent subantarctic islands and waters, or South Africa ..... → 11



Fig. 434 *Arctocephalus australis*

- 11a. Very large, robust build; head massive; distribution limited to southwestern and southern Africa and southeastern Australia, including Tasmania (Fig. 435) ..... **South African or Australian fur seal (*Arctocephalus pusillus*)** p. 254
- 11b. Medium size; moderate build and head size; distribution limited to New Zealand and adjacent subantarctic islands, and southwestern Australia (Fig. 436) ..... **New Zealand fur seal (*Arctocephalus forsteri*)** p. 248



Fig. 435 *Arctocephalus pusillus*



Fig. 436 *Arctocephalus forsteri*

- 12a. No distinct mane on adult males; head of moderate size, with relatively long dog-like muzzle; bulging sagittal crest on adult male; distribution limited to the temperate eastern North Pacific or area around the Galapagos Islands and adjacent waters (Fig. 437) . . . . . **California or Galapagos sea lion (*Zalophus californianus*)** p. 230
- 12b. Heavy mane on adult males; head massive with blunt broad muzzle that is usually relatively short (the latter not so for adult male Australian sea lion) (Fig. 438) . . . . . → 13

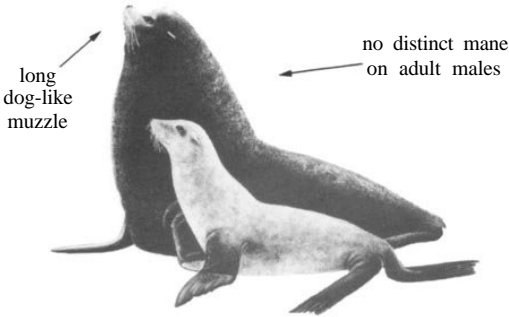


Fig. 437 *Zalophus californianus*

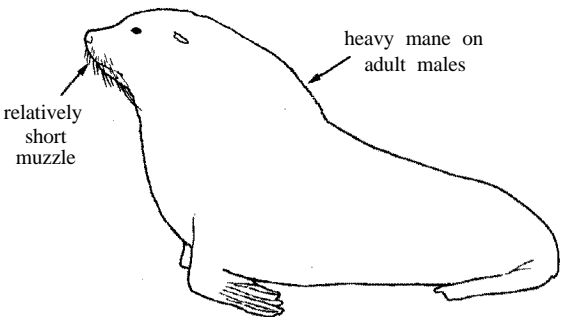
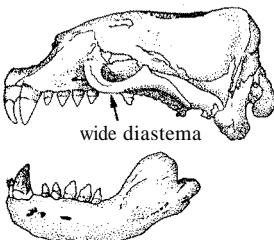


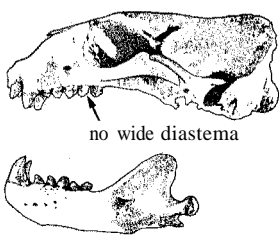
Fig. 438

- 13a. Both sexes massive in size; wide diastema (gap) between 4th and 5th post-canine teeth; distribution limited to temperate and subpolar rim of North Pacific (Fig. 439) . . . . . **Steller sea lion (*Eumetopias jubatus*)** p. 228
- 13b. Both sexes moderate in size; no wide diastema between 4th and 5th post-canines; distribution limited to Southern Hemisphere (Fig. 440) . . . . . → 14



LATERAL VIEW OF SKULL

Fig. 439 *Eumetopias jubatus*



LATERAL VIEW OF SKULL

Fig. 440

- 14a. Extremely heavy (thick) mane of very long guard hairs; very short broad muzzle; massive (deep and wide) lower jaw; distribution along coastal South America, from Peru on the west coast, south to Cape Horn, and north to Brazil on the east coast, including the Falkland Islands (Fig. 441) . . . . . **South American sea lion (*Otaria byronia*)** p. 232
- 14b. Moderate mane of medium-length guard hairs; muzzle blunt, but moderate in length; distribution limited to New Zealand and adjacent subantarctic islands, or southern to southwestern Australia . . . . . → 15

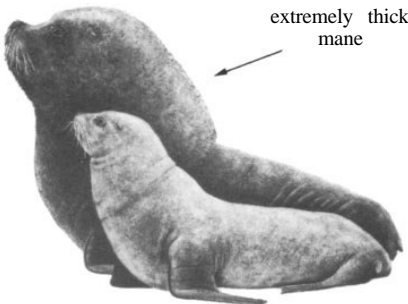


Fig. 441 *Otaria byronia*



- 15a. Adult males with mane extending up onto the top of the head and relatively flat topped muzzle: generally brownish, with yellowish back of neck and crown; females often strikingly bicoloured, dark above, pale below, with pale colour on the face and over the eyes; distribution limited to southern and southwestern Australia in coastal waters (Fig. 442) . . . . . **Australian sea lion (*Neophoca cinerea*) p. 234**
- 15b. Adult males with mane that stops at nape (head seems disproportionately small because of this); muzzle usually slightly convex in silhouette; colour blackish brown: distribution limited to southern New Zealand and adjacent subantarctic islands (Fig. 443). . . . .  
. . . . . **New Zealand sea lion (*Phocartos hookeri*) p. 236**

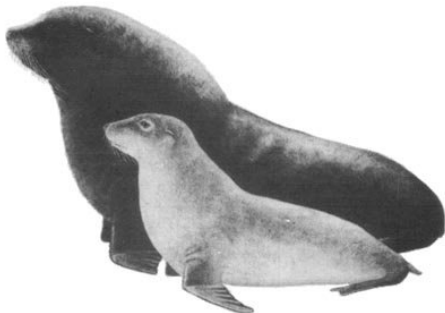


Fig. 442 *Neophoca cinerea*



Fig. 443 *Phocartos hookeri*

- 16a. Vibrissae smooth in outline; pelage generally without conspicuous spots, rings, blotches, bands, or streaks . . . . . → 17
- 16b. Vibrissae beaded (sometimes only weakly) in outline; pelage generally with conspicuous spots, rings, blotches, bands, or streaks . . . . . → 22
- 17a. Foreflippers square to rounded, with equal length digits, or digits 2 to 4 slightly longer; vibrissae very densely packed, so as to obscure mouthline (Fig. 444) . . . . .  
. . . . . **Bearded seal (*Erignathus barbatus*) p. 274**
- 17b. Foreflippers pointed, with first digit longer and digits 2 to 5 becoming shorter; vibrissae with sparse to moderate density (Fig. 445). . . . . → 18



digits equal in length

Fig. 444 *Erignathus barbatus*



first digit longer

Fig. 445

- 18a. Adults medium-sized; muzzle and head moderate in size and somewhat flattened; nostrils pointing slightly upwards; males without enlarged nose; females with 4 mammary teats (Fig. 446) ..... (Monk seal) → 19
- 18b. Adults very large; muzzle and head very broad and deep; nostrils point ahead or down; adult males with large inflatable proboscis; females with 2 mammary teats (Fig. 447) .. (Elephant seal) → 21

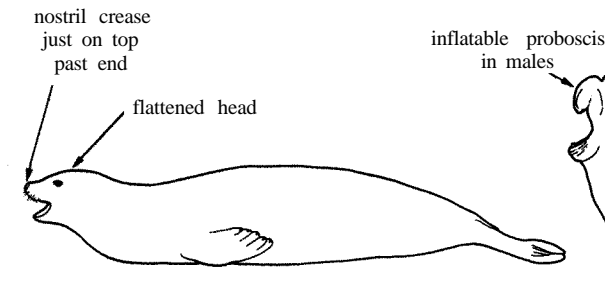


Fig. 446 Monk seal

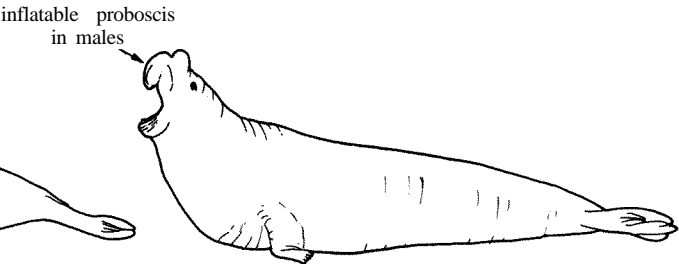


Fig. 447 Elephant seal

- 19a. Distribution limited to the North Pacific Ocean (generally the northwestern Hawaiian Islands) (Fig. 448) ..... **Hawaiian monk seal (*Monachus schauinslandi*)** p. 282
- 19b. Distirbution limited to the North Atlantic Ocean and surrounding seas (Mediterranean, Black, and Caribbean seas, and Gulf of Mexico) ..... → 20



Fig. 448 *Monachus schauinslandi*

- 20a. Distribution limited to portions of the Mediterranean Sea, Black Sea, and West African coast) (Fig. 449) ..... **Mediterranean monk seal (*Monachus monachus*)** p. 278
- 20b. Formerly found in the Caribbean Sea and Gulf of Mexico (now considered extinct) (Fig. 450) ..... **West Indian monk seal (*Monachus tropicalis*)** p. 280



Fig. 449 *Monachus monachus*

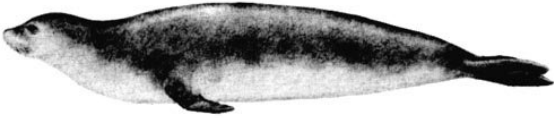


Fig. 450 *Monachus tropicalis*

- 21a. Distribution limited to temperate eastern and central North Pacific (Fig. 451) . . . . . Northern elephant seal (*Mirounga angustirostris*) p. 284
- 21b. Distribution circumpolar in polar to temperate waters of the Southern Hemisphere (Fig. 452). . . . . Southern elephant seal (*Mirounga leonina*) p. 286

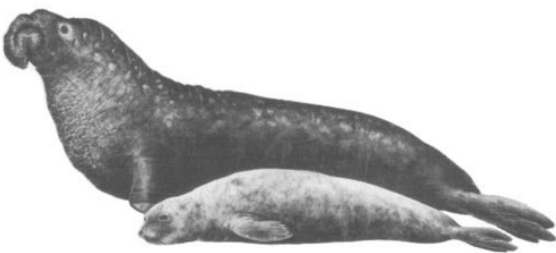


Fig. 451 *Mirounga angustirostris*



Fig. 452 *Mirounga leonina*

- 22a. Distribution limited to Southern Hemisphere . . . . . (“Antarctic seal”) → 23
- 22b. Distribution limited to Northern Hemisphere. . . . . → 26
- 23a. Head and muzzle short and wide; foreflippers about one-fifth or less of standard length; post-canine teeth relatively simple (Fig. 453) . . . . . → 24
- 23b. Head and muzzle long and narrow; foreflippers long, at least one-fourth standard length; post-canines ornate and multi-cusped (Fig. 454) . . . . . → 25

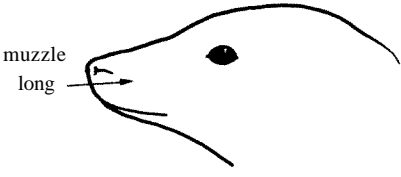


LATERAL VIEW OF HEAD

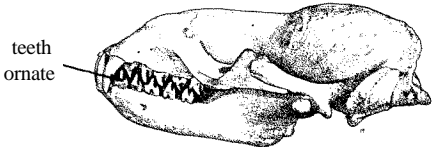


LATERAL VIEW OF SKULL

Fig. 453



LATERAL VIEW OF HEAD



LATERAL VIEW OF SKULL

Fig. 454

- 24a. Adults very long (2.5 to 3 m) and massive, with a relatively small head; numerous blotches of light and dark, particularly on sides and belly (Fig. 455) . . . . . Weddell seal (*Leptonychotes weddellii*) p. 294
- 24b. Adults 2 to 2.5 m; long streaks of colour on face, neck, chest, and extending onto the sides; head more normal in size, neck appears thick and enlarged (Fig. 456) . . . . . Ross seal (*Ommatophoca rossii*) p. 290

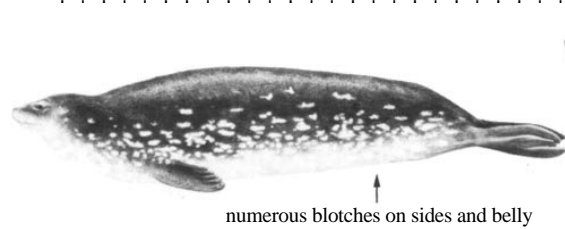


Fig. 455 *Leptonychotes weddellii*

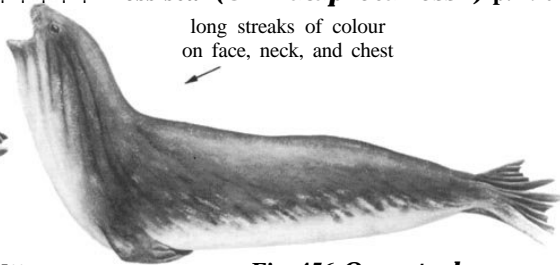
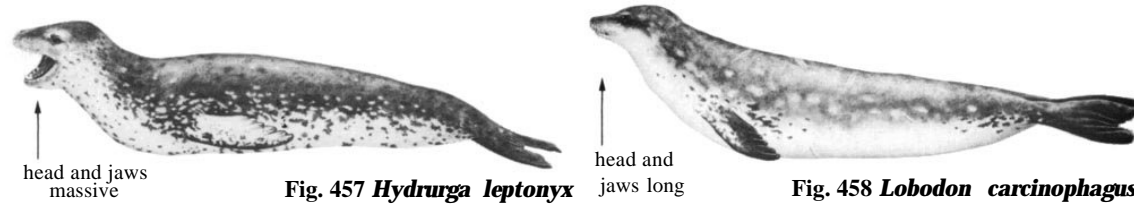


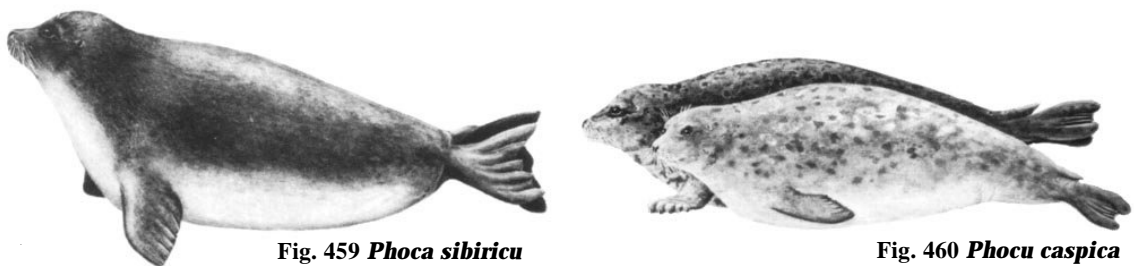
Fig. 456 *Ommatophoca rossii*

- 25a Head and jaws massive and reptilian in appearance; body long (to 3 m), and serpent-like, thickest at shoulders; foreflippers very long, almost one-third standard length; foreflipper claws very small (Fig. 457) . . . . . **Leopard seal (*Hydrurga leptonyx*)** p. 292
- 25b. Head and jaws long, but tapering, with a somewhat flattened muzzle; body moderately robust, more filled out; foreflippers long, but only to about one-fourth standard length; foreflipper claws more normal in size (Fig. 458). **Crabeater seal (*Lobodon carcinophagus*)** p. 288



- 26a. Distribution limited to either Lake Baikal or the Caspian Sea, far from oceanic areas . . . → 27
- 26b. Distribution oceanic or in lakes or rivers near oceanic areas . . . . . → 28

- 27a. Distribution limited to Lake Baikal (Fig. 459). . . . . **Baikal seal (*Phoca sibiricu*)** p. 264
- 27b. Distribution limited to the Caspian Sea (Fig. 460) . . . . . **Caspian seal (*Phoca caspica*)** p. 266



- 26a. Pelage markings consist of bands or broad swaths of light or dark colour . . . . . → 29
- 28b. Pelage markings consist of spots, rings, or blotches . . . . . → 30

- 29a. Body orange-brown to black; fighter colour bands encircling each foreflipper, around neck, and around abdomen; distribution limited to Bering Sea, Sea of Okhotsk, and adjacent Arctic Ocean (Fig. 461) . . . . . **Ribbon Seal (*Phocu fasciata*)** p. 270
- 29b. Body generally silvery white, with some animals sooty grey and others with scattered blotches; body marked with a broad swath of black on each side, meeting (generally) over the shoulders to roughly form a V pattern (Some harp seals never develop the harp pattern and remain blotched as adults. These blotched animals can be separated from grey seals, based on their smaller size, clearly demarcated and shorter muzzle, and closer-set nostrils; and from hooded seals, based on their longer, but thinner, head and muzzle and lack of a hood pattern on the head.) (Fig. 462) . . . . . **Harp seal (*Phocu groenlandica*)** p. 268



- 30a. Pelage markings consist of irregular, small to large, dark brown to black or sometimes tan blotches; distribution limited to North Atlantic and adjacent Arctic areas ..... → 31
- 30b. Pelage markings consist primarily of round to oval smaller spots or rings around spots, or a combination of the above. .... → 32

- 31a. Head broad and short with short muzzle on females, and large fleshy nasal bladder (with overhanging nostrils) on males; head dark in both sexes from merged blotches, creating hooded appearance (Fig. 463) ..... **Hooded seal (*Cystophora cristata*)** p. 276
- 31b. Head and muzzle very long and somewhat narrow; in silhouette, nose is rounded outwards (convex) in males and straight to slightly rounded in females; adult males dark brown to grey-black with lighter (tan) blotches (Fig. 464) . **Grey seal (*Halichoerus grypus*)** p. 272

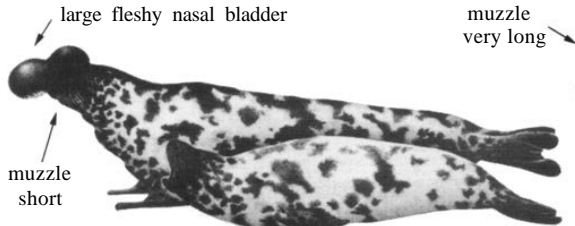


Fig. 463 *Cystophora cristata*



Fig. 464 *Halichoerus grypus*

- 32a. Pelage pattern consists mostly of small round to oval spots with few or no rings (Fig. 465) ..... **Ringed seal (*Phoca hispida*)** p. 262
- 32b. Pelage pattern with few or no spots, not encircled by a lighter ring ..... → 33

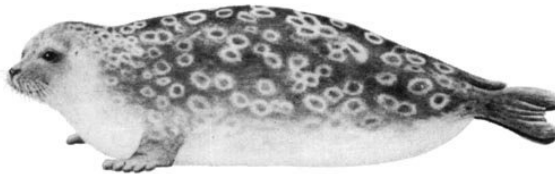
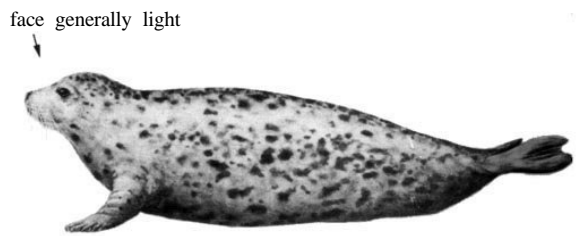
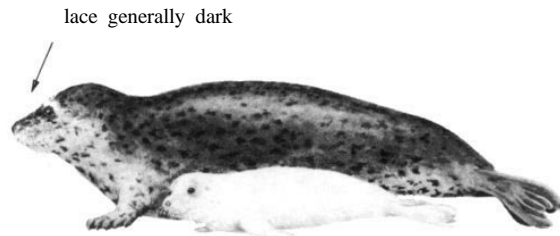


Fig. 465 *Phoca hispida*

- 33a. Often no, occasionally a few, rings; spotting more even from top to bottom; face generally dark, like the back; distribution limited to North Pacific and adjacent Arctic areas (Fig. 466) ..... **Largha seal (*Phoca largha*)** p. 260
- 33b. Usually a moderate number of light rings around spots: more heavily spotted above than below: face generally light, unlike the back (Fig. 467) ... **Harbour seal (*Phoca vitulina*)** p. 258



4.2 Key to Identification of Skulls of Pinniped Families

- 1a. Tympanic bullae inflated and rounded; supraorbital processes absent; nasals penetrating posteriorly deeply between frontals on midline (Fig. 466) ... **(Phocoidea) Phocidae: True seals**
- 1b. Tympanic bullae flat, small, and angular; supraorbital processes present (Otariidae) or absent (Odobenidae); frontals penetrating anteriorly slightly to moderately between nasals on the midline (Fig. 469) ..... **(Otarioidea) → 2**

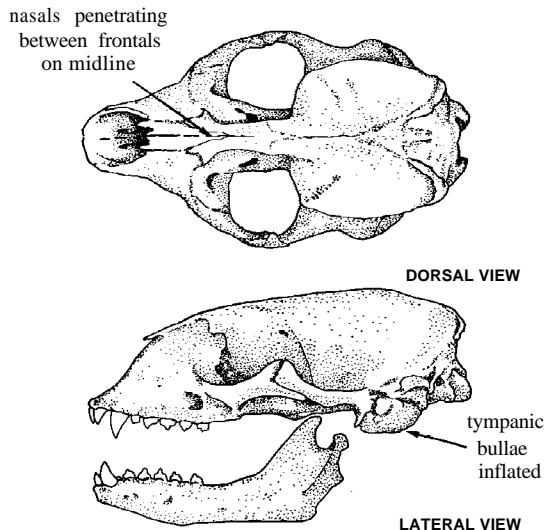


Fig. 468 Phocidae

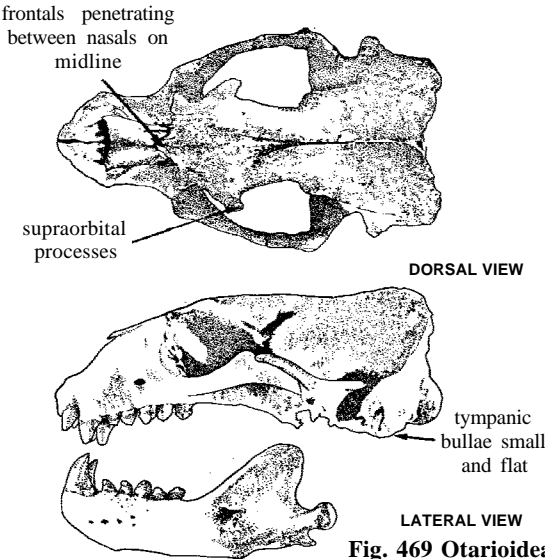


Fig. 469 Otarioidea

- 2a. Upper canines not enlarged into tusks; supraorbital processes present; 2 lower incisors on each side; transverse groove on first 2 upper incisors; 5 or 6 post-canines (Fig. 470) ..... **Otariidae: Eared seals**
- 2b. Upper canines massive, enlarged to form tusks; no supraorbital processes; no grooves on upper incisors; only 3 post-canines (Fig. 471). ..... **Odobenidae: *Odobenus* (Walrus)**

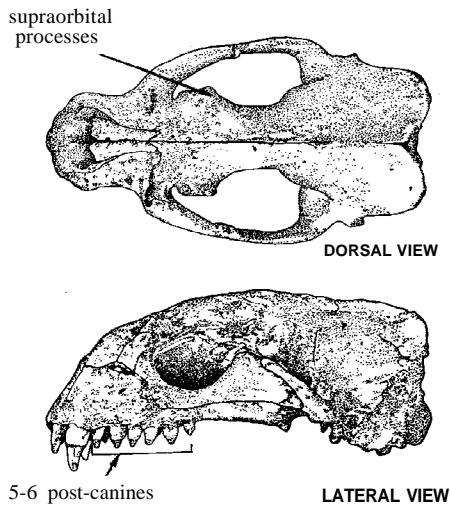


Fig. 470 Otariidae

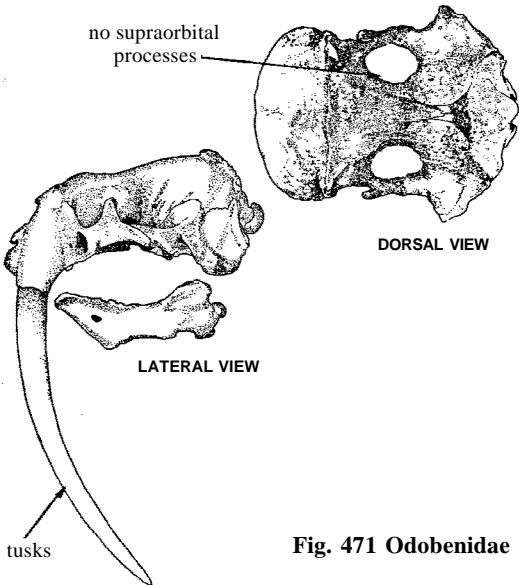


Fig. 471 Odobenidae

### 4.1.3 Guide to Families of Pinnipeds

#### OTARIIDAE

All sea lions and fur seals have a polygynous mating system and pronounced sexual dimorphism. Characteristics of this family are: small external ear flaps (pinnae), smooth vibrissae, light skin, a dense double layer of fur with short underfur and longer guard hairs, partially hairless fore- and hindflippers, 4 teats in females, scrotal testes, and skulls with supraorbital processes and sagittal crests (the latter enlarged in adult males only). Eared seals swim with their large foreflippers and can rotate their hindflippers forward to walk and climb on all fours on land. While resting at sea most elevate flippers in various combinations out of the water.

**Eared seals** (14 species in 7 genera) p. 228

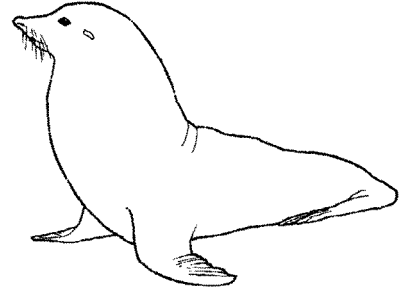


Fig. 472 Otariidae

#### ODOBENIDAE

Walrus are enormous animals that combine features of both otariids (moderately long foreflippers that can lift the body off the ground) and phocids (lack of ear pinnae). The neck is long and the hindflippers can rotate under the body and permit walking, although walrus are so bulky they cannot walk as easily as most otariids. The tail is sheathed in skin and not readily visible or free, as in other pinnipeds. The tusks, which are enlarged canines are a unique feature, and are important in fighting and assisting with hauling out. Walrus have numerous short smooth vibrissae on their thick fleshy mystacial ("moustache") pads. The testes of walrus are internal, not scrotal, and females have 4 retractable mammary teats. The skin is dark in younger animals and lightens with age. Walrus swim with phocid-like side-to-side strokes of the hindflippers, with assistance from the foreflippers.

**Walrus** (1 species in 1 genus) p. 256

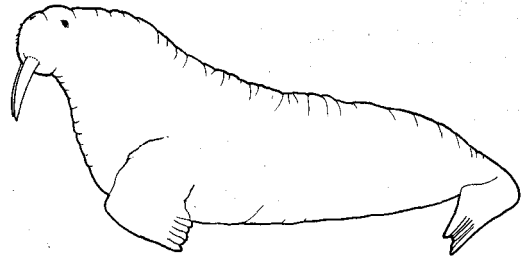
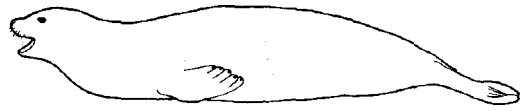


Fig. 473 Odobenidae

**PHOCIDAE**

The true, or earless, seals include the largest of the pinnipeds, the elephant seals. Species within the group have variable degrees of sexual dimorphism (in some species, females are the larger sex). Phocids are characterized by the absence of external ear pinnae, a short muzzle, beaded vibrissae, dark skin, short fur, generally 2 teats in females, internal testes, furred fore- and hindflippers, and the absence of supraorbital processes or an enlarged sagittal crest on the skull. Propulsion in water is provided by figure-eight movements of the hindflippers, except in leopard seals which primarily swim like otariids with foreflipper strokes. Movement on land is by inch-worming or "galumphing," without much help from the relatively small foreflippers; movement on ice is accomplished by combinations of rapid pulling strokes with the foreflippers or sculling with hindflippers, and snake-like writhing of the body depending on the species and the situation.

**True seals** (19 species in 10 genera) p. 258



**Fig. 474 Phocidae**



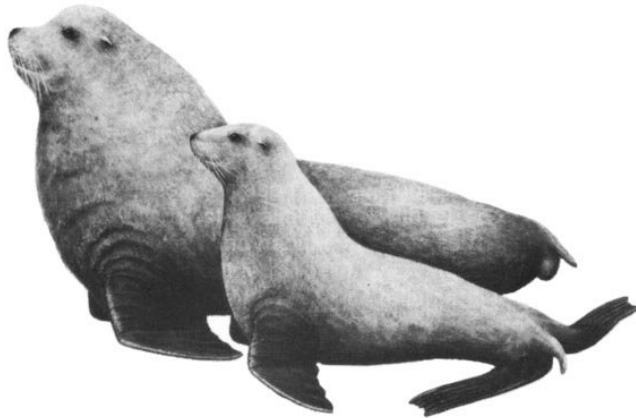
#### 4.1.4 FAO Species Identification Sheets

***Eumetopias jubatus*** (Schreber, 1776)

OTAR Eumet 1

SSL

**FAO Names:** **En** - Steller sea lion; **Fr** - Lion de mer de Steller; **Sp** - Lobo marino de Steller.



475 *Eumetopias jubatus*

**Distinctive Characteristics:** Steller sea lions are enormous and powerfully built. Aside from the overall large size of adults and generally robust build of all age and sex classes, the most conspicuous characteristics are the appearance of the head and muzzle, which are massive and wide. The eyes and ear pinnae appear small when compared with the size of the rest of the head. The vibrissae can be very long in adults. In all but adult males, there is little or no clear demarcation between the crown of the head and the muzzle, thus no forehead. In adult males, development of the sagittal crest produces a variable amount of forehead demarcating the muzzle and crown. Breeding bulls in their prime are very robust in the neck and shoulder area and have a mane of longer guard hairs. Both the fore- and hindflippers are very long and broad for an otariid. Collectively, these features make the upper body appear massive in relation to the lower body.

Coloration in adults is pale yellow to light tan above, darkening to brown and shading to rust below. Unlike most pinnipeds, when wet, Steller sea lions are paler, appearing greyish white. Pups are born with a thick blackish brown lanugo that is moulted by about 6 months of age. All ages and sexes have contrasting black flippers, naked except for a short stubble of dark fur partially covering the upper surface.

The dental formula is I 3/2, C 1/1 PC 5/5. There is a wide diastema (gap) between the fourth and fifth post-canines.

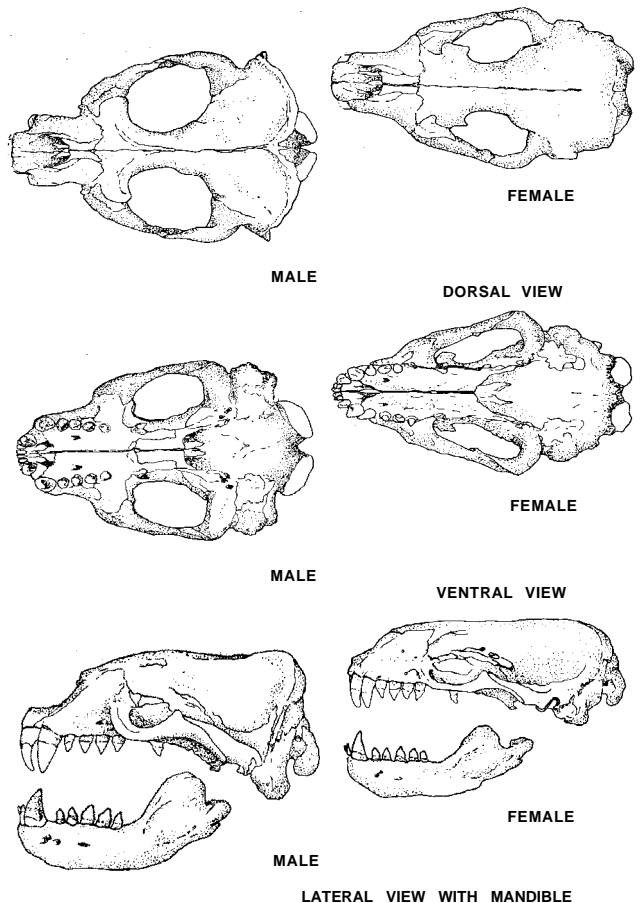


Fig. 476 Skull

**Can be confused with:** The large robust bodies of Steller sea lions will allow them to be easily distinguished from the species of fur seals that inhabit their range. California sea lions (p. 230) are most likely to cause confusion. Careful attention to robustness, head and muzzle shape, coloration, and the size of bulls will allow them to be differentiated. Also, Steller sea lion bulls have much smaller, more posterior sagittal crests than those of California sea lion males.

**Size:** The maximum length of adult males is about 3.3 m and average weight is 1 000 kg. The maximum length for adult females is about 2.5 m and average weight is 273 kg. Pups are born at an average of about 1 m and 18 to 22 kg.

**Geographical Distribution:** Steller sea lions are found from central California (formerly southern California), north to the Bering Sea, west along the Aleutian chain to the Kamchatka Peninsula, and south to northern Japan. Throughout their range they are primarily found from the coast to the outer continental shelf. However, they frequent deep oceanic waters in some parts of their range.

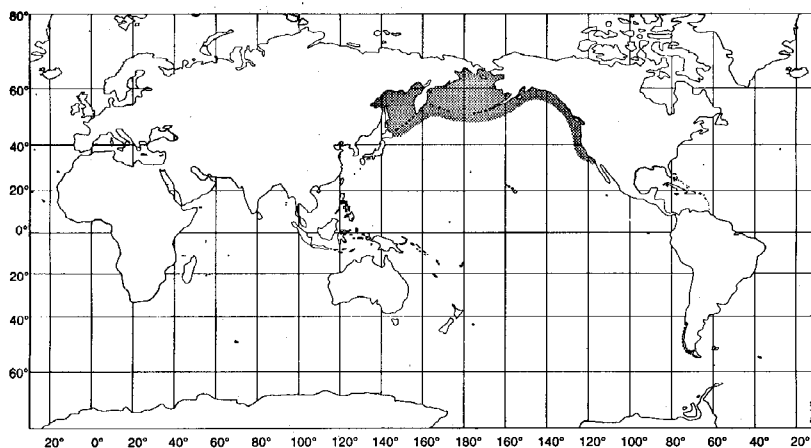


Fig. 477

**Biology and Behaviour:** Steller sea lions breed in the late spring and summer. They are highly polygynous; adult males arrive before females and establish territories, which they aggressively and vociferously defend. Steller sea lions sometimes leave their haulouts in large groups of over 1 000 individuals; however, sightings at sea are most often of groups of 1 to 12 animals. They aggregate in areas of prey abundance, particularly around fishing operations, such as trawlers and salmon driftnetters, where they feed on netted, fish and bycatch. Steller sea lions feed on many varieties of fish and squid, with a decided preference for bottom species. Apparently, much feeding occurs at night.

**Exploitation:** Historically this sea lion was sporadically harvested for fat, meat, and "trimmings" (vibrissae and testes). There was a government-sponsored cull in this century that was pursued with the hope of limiting population size and its impact on commercially important fish species. Currently however, the Steller sea lion is suffering a massive range-wide population decline for, as yet, unknown reasons. The chief suspected cause is the over-exploitation of stocks of pollock in the high North Pacific. Other reasons suggested for the decline include long term change in ocean temperature, accumulation of human produced toxins, and disease. It may be that the decline is attributable to the subtle interaction of several of these factors. In 1990, the Steller sea lion was declared a threatened species under the United States Endangered Species Act.

**IUCN Status:** Vulnerable.

***Zalophus californianus*** (Lesson, 1828)

OTAR Zal 1

CSL

**FAO Names:** En - California sea lion (*Z. c. californianus*), Galapagos sea lion (*Z. c. wollebaeki*), and Japanese sea lion (*Z. c. japonicus*); Fr - Lion de mer de Californie; Sp - Lobo marino de California.



Fig. 478 *Zalophus californianus*

**Distinctive Characteristics:** The California sea lion is the well-known performing “seal” of zoos, circuses, and oceanaria. In both sexes, the muzzle is dog-like and long, slightly tapering to a moderately blunt end. Adult males are substantially more robust and larger than females. In adult males, the sagittal crest creates a high peaked crown. The crest begins to emerge at sexual maturity and, although highly variable, is most prominent in full-grown males. On most males, especially darker individuals, the crest and a corresponding area on the muzzle and around the eyes lighten with age. Females lack a pronounced crest and have a thinner head that slopes more gently to the end of the muzzle. This makes subadult and juvenile males very difficult to distinguish from females.

Colour of California sea lions is highly variable. When dry, the coat of most adult males is dark brown. However, many males do not darken completely, remaining sandy brown on the sides, belly, and rear quarters. Adult females and juveniles are uniformly tan. Pups **are** born with a thick brownish black lanugo that is generally moulted by the end of the first month. The succeeding light brown juvenile coat is shed 4 to 5 months later, and is replaced by adult coloration. All ages and sexes have contrasting black flippers, naked except for a short stubble of dark fur partially covering the upper surface.

The dental formula is variable, but is usually I 3/2, C 1/1, PC 5/5 (in the California race) or PC 6/5 (in the Galapagos race).

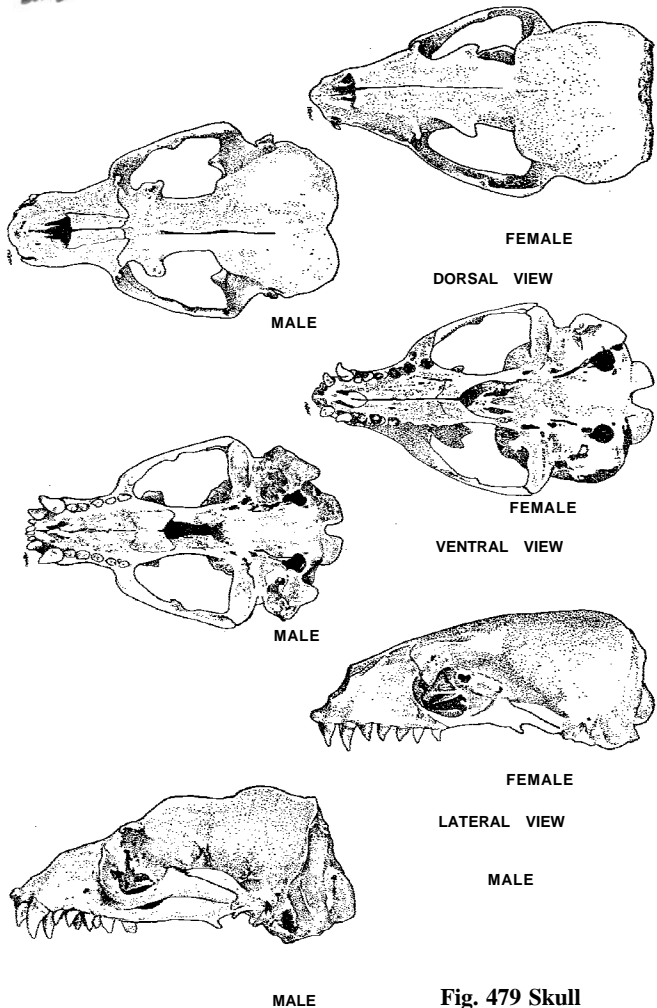


Fig. 479 Skull

**Can be confused with:** California sea lions share their range with 3 other otariids (Steller sea lions [p.228], and northern [p. 238] and Guadalupe [p.240] fur seals). Galapagos sea lions overlap with Galapagos fur seals (p. 244) and South American sea lions (p. 232). These sea lions can be separated from the similar, but much larger, Steller sea lion and similar sized South American sea lion, on the basis of head and muzzle shape and size, and relative size of the ear pinnae. Additionally fore- and hindflippers are relatively shorter than in the Steller sea lion. (See the Guadalupe, Galapagos, and northern fur seal accounts for more detail on separating California and Galapagos sea lions from fur seals.)

**Size:** Male California sea lions reach lengths of 2.4 m, and weights of more than 390 kg. Females only reach 2 m, and weigh an average of 110 kg. Newborn pups are about 80 cm long and 6 to 9 kg. There is very little information on the sizes of Galapagos sea lions (estimated weights are 200 kg for males, and 50 to 100 kg for females).

**Geographical Distribution:** There are 3 recognized subspecies of *Zalophus californianus*: *Z. c. californianus*, in the eastern North Pacific from central Mexico north to British Columbia, including the Gulf of California; *Z. c. wolfebaeki*, restricted to waters surrounding the Galapagos Islands; and *Z. c. japonicus*, formerly found in the western Pacific (off Japan and Korea), but now considered extinct. California sea lions are found in coastal and continental shelf waters throughout their range. They frequent bays, harbours, and river mouths and regularly haul-out on buoys and jetties. They can occasionally be found up to several hundred kilometers offshore as well.

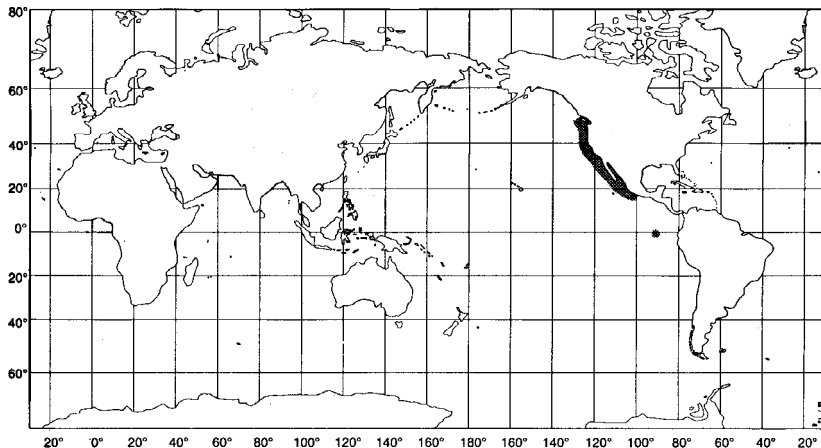


Fig. 480

**Biology and Behaviour:** Breeding takes place from May through July (California sea lions), and from May through January (Galapagos sea lions). Males are highly polygynous and hold territories both on land and in shallow water nearshore. In California sea lions, most adult males and many subadults and juveniles of both sexes take part in a post-breeding migration northward from the rookeries. Galapagos sea lions apparently stay around the Galapagos Archipelago all year.

At sea, California sea lions often raft at the surface alone or in groups. Animals in such rafts frequently raise their flippers out of the water. California sea lions often "porpoise" when traveling rapidly at sea, sometimes in large groups. Juveniles and subadults may perform acrobatic and high vertical leaps, and individuals of all ages surf breakers and ride in the wakes of vessels. California sea lions are often seen with a wide variety of dolphin and baleen whale species.

California sea lions feed on squid, octopus, and many species of fishes. Because of their taste for commercially important fish species and their boldness, California sea lions are considered a nuisance by many sport and commercial fishermen.

**Exploitation:** Currently, there is no significant direct catch of California sea lions. Many sea lions, however, are shot by fishermen and certainly many others are taken incidentally during fishing operations. Set and drift gillnets, in particular, appear to be taking large numbers each year. The total population of the California sea lion in 1989 was estimated to be 160 000 and increasing, about equally split between Mexico and the United States. The numbers of Galapagos sea lions are unknown. Unfortunately, the Japanese race of this sea lion is now extinct.

**IUCN Status:** Insufficiently known; extinct (*Z. c. japonicus* only).

***Otaria byronia*** (Shaw, 1800)

OTAR Otar 1

SEL

**FAO Names:** En - South American sea lion; Fr - Lion de mer d'Amérique du Sud; Sp - Lobo común.

**Other scientific names still in use:** *Otaria flavescens* (Shaw, 1800).



**Fig. 481 *Otaria byronia***

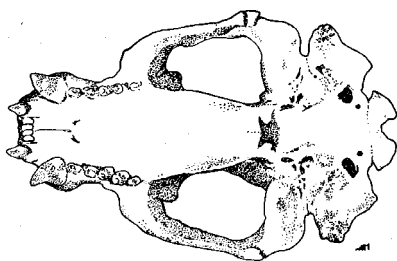
**Distinctive Characteristics:** The South American sea lion is stocky in build. In both sexes the muzzle is blunt; although relatively short, it is deep, wide, and slightly upturned at the end. The lower jaw is particularly large, wide, and deep and it juts slightly beyond the upper jaw. The ear pinnae are small and lie close to the side of the head; they are especially inconspicuous in adult males. Adult males are unmistakable, bearing a mane of long, coarse, erectile guard hairs, extending from forehead to shoulders and chin to mid-chest. The neck, head, and jaws are much more massive than those of females. Their great anterior bulk makes the hind quarters seem too small.

Adult females and subadults of both sexes have coats shaded from yellow to brownish orange. They are not necessarily uniformly coloured, but can be patterned with areas of slightly different hues. Most males darken with age, becoming brownish orange, although the mane and underparts frequently remain lighter. Males sometimes have a darker face, giving them a slightly masked appearance. Adults of both sexes can be pale gold in colour. Pups are born black above and greyish orange below. They undergo their first moult approximately 1 month after birth, becoming dark brown. This colour fades during the rest of the first year to a paler brown to tan colour, with paler areas in the face.

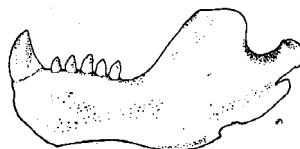
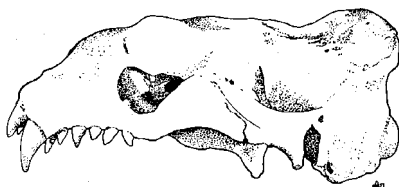
The dental formula is I 3/2, C 1/1, PC



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW  
WITH MANDIBLE

**Fig. 482 Skull of male**

**Can be confused with:** The South American fur seal (p. 246) is the only otariid that regularly shares the range of this sea lion. At least 5 other otariids occur, mostly as vagrants, within the range of the South American sea lion: the Juan Fernandez (p. 242) Galapagos (p. 244), Antarctic (p. 252), and subantarctic (p. 250) fur seals, and the Galapagos sea lion.(p. 230). For each of these, note characteristics of the fur, mane of adult males, flippers, head and muzzle, and ear pinnae.

**Size:** Males reach 2.6 m in length and weights of up to 350 kg; females reach 2.2 m and 144 kg. At birth, pups are 11 to 15 kg and 78 to 85 cm long.

**Geographical Distribution:** South American sea lions are widely distributed, occurring more or less continuously from northern Peru on the west side of South America, northward up the east coast to southern Brazil, including the Falkland Islands. This is primarily a coastal species, usually found over the continental shelf and slope. They less frequently occur in deeper waters. South American sea lions venture into fresh waters in rivers and around glaciers.

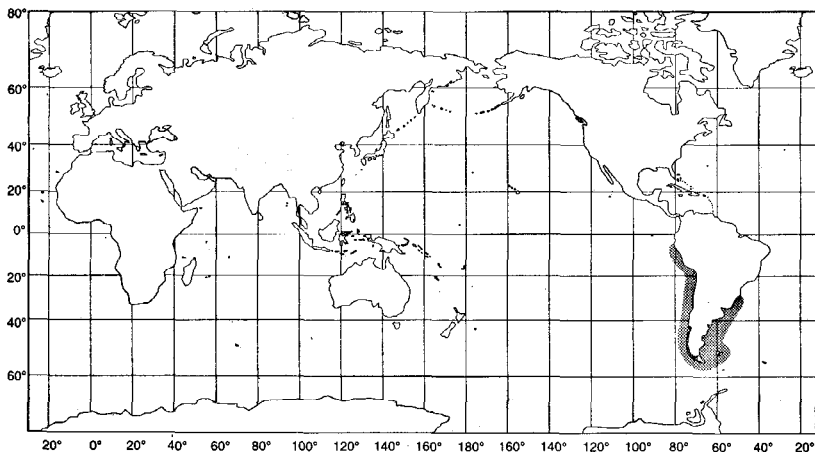


Fig. 483

**Biology and Behaviour:** The timing of the breeding season in this species varies by location and latitude. The earliest breed in September, the latest in March. In many areas the peak is from mid-December to early February. Most pups are born from early to late January. Generally, rookeries are continuously occupied by at least some animals, and the species has been described as sedentary. Although there is no known migration, many animals, particularly males, may disperse widely. At sea South American sea lions frequently raft alone or in small to large groups. They have been reported in association with feeding cetaceans and seabirds.

They are opportunistic feeders, taking a wide variety of prey. Their diet includes many species of benthic and pelagic fishes, and invertebrates such as lobster krill, squid, octopus, and jellyfish (and occasionally penguins and young South American fur seals).

**Exploitation:** Humans have exploited South American sea lions for hides, meat, and fat from prehistoric times to the present. Native peoples, explorers, sealers, and government-sponsored commercial ventures have taken their toll on sea lion populations at various times. Commercial harvesting continues in Chile, while throughout its range the South American sea lion is generally regarded as a nuisance and competitor with local fisheries. Many animals are taken annually in gillnets or are shot or killed with explosive charges set off near them when they approach fishing nets. Sea lion meat is regularly used as bait in crab trap fishing operations in some regions. This species may be in danger, at least in portions of its range, from overfishing of vital food stocks. Historically, more than 300 000 may have inhabited the Falkland Islands alone, whereas surveys from 1965 yielded an estimate of only 30 000.

**IUCN Status:** Insufficiently known.

***Neophoca cinerea*** (Peron, 1816)

OTAR Neoph 1

ASL

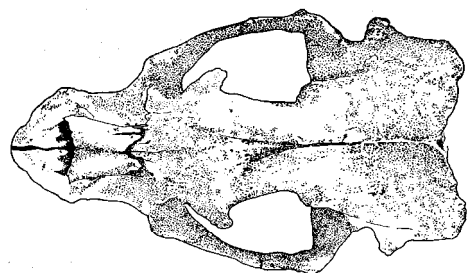
**FAO Names:** En - Australian sea lion; Fr - Lion de mer d'Australie; Sp - Lobo marino de Australia.

Fig. 484 *Neophoca cinerea*

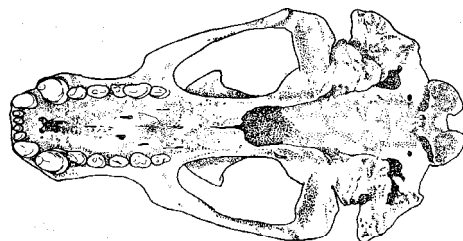
**Distinctive Characteristics:** Australian sea lions have a large head and a muzzle that is long and somewhat narrow, tapering slightly to a rounded end in profile. The ear pinnae are small and lie close to the head. The vibrissae are moderate in length, reaching just beyond the area of the ears. In adult males, the head and especially the neck and shoulders are greatly enlarged.

At birth, Australian sea lion pups are dark brown, with a paler crown and a dark facial mask. Pups begin to moult their birth coat at 2 months and change to their juvenile pelage, which is similar to that of adult females. This coat is fawn to silvery grey above and tan to pale yellow below. The demarcation between light and dark zones is high on the neck, but dips downward to the insertion of the flippers. The foreflippers are often darker above. The light coloration sometimes extends to the area around the ears (which are often particularly light and appear highlighted), the eyes, and the muzzle. In some animals there may be little discernable contrast between coloration above and below. Subadult males are coloured like females, but darken as they mature. The first evidence of this appears as dark spotting on the chest and darkening of the muzzle. Adult males have a dark brown coat, a whitish creamy crown and nape, and a slightly paler chest and lower throat area. This accentuates the darker "masked" face, chin, and muzzle. Younger bulls are incompletely marked and have a whitish ring around the eyes.

The dental formula is I 3/2, C 1/1, PC 5/5 (there is some variation in upper post-canine numbers).



DORSAL VIEW



VENTRAL VIEW

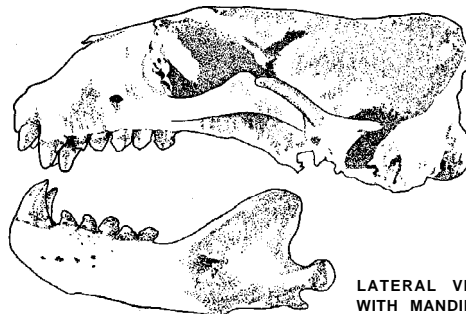
LATERAL VIEW  
WITH MANDIBLE

Fig. 485 Skull of male

**Can be confused with:** New Zealand (p. 248) and Australian (p. 254) fur seals occur within or very near the present range of Australian sea lions. Australian sea lions can be differentiated from these and all other southern fur seals based on coloration, lack of dense under-fur, generally shorter pelage (exclusive of the mane on adult males) and vibrissae, head and muzzle shape, size of the ear pinnae, and size and shape of toes on the hindflippers.

**Size:** Very little information exists, but males reach lengths of at least 2.5 m and weights of 300 kg. Females reach at least 1.8 m and 105 kg. At birth, pups are approximately 60 to 70 cm and weigh 6.5 to 8 kg.

**Geographical Distribution:** Australian sea lions are found only around southern and southwestern Australia. They inhabit islands and the mainland coast, ranging over waters of the adjacent continental shelf. Little is known of their distribution at sea.

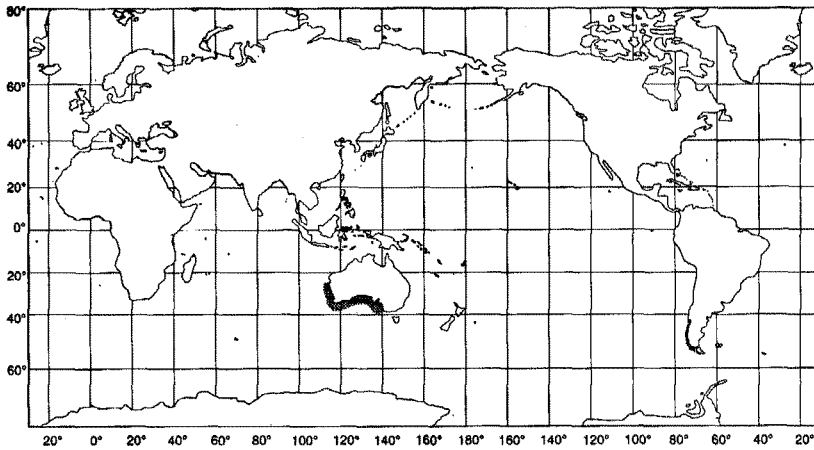


Fig. 486

**Biology and Behaviour:** Breeding in this polygynous species is unusual for a pinniped, in that pups can be born at many different times of year. Although little information is available on behaviour at sea, Australian sea lions are known to porpoise when traveling rapidly, and also to surf beach waves. These seals are considered to be non-migratory. The greatest distance recorded for a tagged animal is approximately 300 km.

Australian sea lions are known to prey on a wide variety of fishes (including rays and small sharks), squid, cuttlefish, and penguins. They are thought to concentrate their efforts on shallow-water benthic prey. Fishermen complain of sea lions robbing lobster traps and fishing nets.

**Exploitation:** There is no direct exploitation at present, and Australian sea lions are protected throughout their limited range. Historically these sea lions had a more extensive range in Australia, but they were severely reduced by 19th Century commercial hunting. In some areas sea lions are killed by fishermen, directly when they interfere in operations and indirectly when caught in working nets. Entanglement in net debris, results in necklaced animals and some unknown level of mortality. The population appears to be stable.

**IUCN Status:** Rare.



***Phocartos hookeri*** (Gray, 1844)

OTAR Phoc 1

NSL

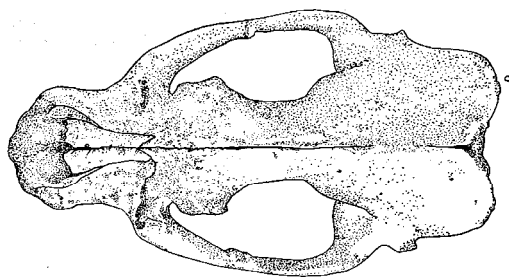
**FAO Names:** **En** - Hooker's sea lion; **Fr** - Lion de mer de Nouvelle-Zelande; **Sp** - León marino de Nuevo Zelandia.



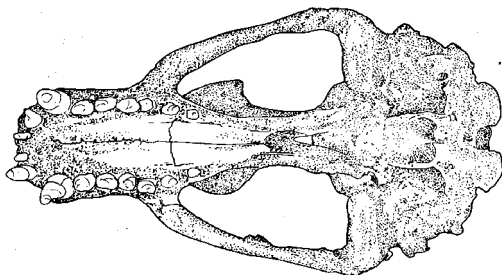
**Fig. 487 *Phocartos hookeri***

**Distinctive Characteristics:** Hooker's sea lions have a muzzle that is fairly broad; the top is either fiat or slightly rounded. The ear pinnae are small and inconspicuous. The vibrissae are moderate in length, reaching as far back as the pinnae on some animals. In adult males, the neck and shoulders are greatly enlarged, and there is a mane of thicker and longer hair from the nape to the shoulders, and the chin to the chest. The head appears small. Adult females are much smaller and thinner than males through the neck, chest, and shoulders; the head and muzzle are narrower or less domed than in males.

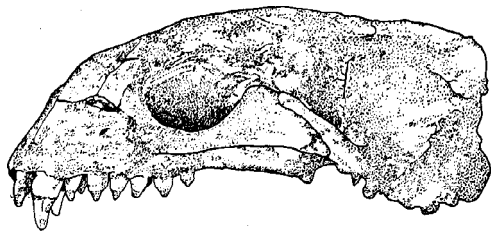
At birth, pups are dark brown with a lighter crown and nape; a pale stripe extends from the crown to the nose, including the mystacial area. Pups begin to moult their birth coat at 2 months. Adult females and subadults of both sexes are silvery grey to brownish grey above and tan to pale yellow below. The demarcation between light and dark is high on the neck and usually extends over the insertion of the flippers. The light coloration often extends above the ears (which can appear highlighted) to the eyes, and down the sides of the muzzle. There is considerable variation in the extent of dark and light areas, particularly on the head. The crown and the top of the muzzle are often darker, giving the appearance of a stripe of dark colour running to the nose, which can be more extensive, and include most of the muzzle. On some animals there may be little discernable contrast between coloration above and below. The foreflippers are often darker above, greyish to brown. Subadult males darken as they mature, and may pass through reddish orange or brown colour phases before attaining sexual maturity.



**DORSAL VIEW**



**VENTRAL VIEW**



**LATERAL VIEW**

**Fig. 488 Skull**

Adult males have a dark brown to charcoal coat, which can have a hint of silver-grey, particularly on the sides and back.

The dental formula is I 3/2, C 1/1, PC 6/5.

**Can be confused with:** Three otariids (New Zealand [p. 248], Antarctic [p. 252], and subantarctic [p. 250] fur seals) are known to occur in or near the present range of the Hooker's sea lion. Hooker's sea lions can be differentiated from fur seals, based on coloration, fur characteristics, head and muzzle shape, size of the ear pinnae, and size and shape of the outer toes on the hindflippers.

**Size:** It is estimated that adult males reach 3.3 m and 400 kg or more. Adult females can be at least 2 m long and weigh 160 kg. Newborns are approximately 60 to 70 cm and weigh 6.5 to 8 kg.

**Geographical Distribution:** The primary habitat of this species is several subantarctic islands south of New Zealand, and their surrounding waters. The principal breeding colonies are in the Auckland islands, Campbell Island, and the Snares Islands. Historically, Hooker's sea lions had a more extensive range that may have included much of New Zealand.

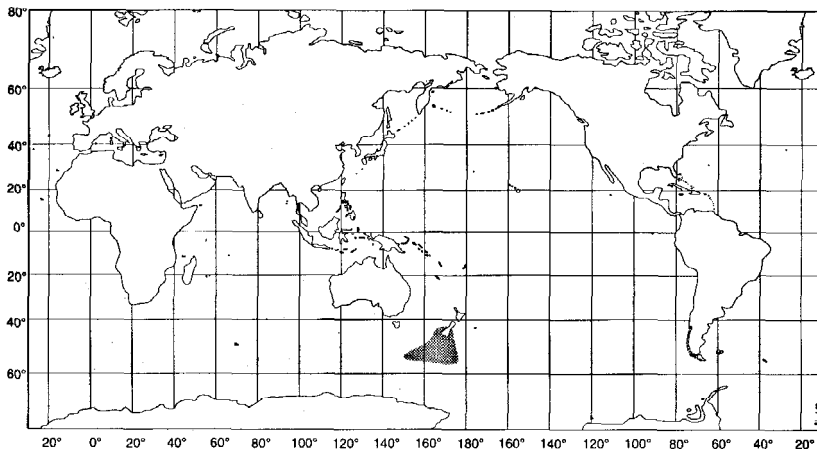


Fig. 489

**Biology and Behaviour:** The breeding season in this species is more defined than that of the similar Australian sea lion. Adult males establish small territories that have fluid boundaries. Pups are born from early December to early January.

Hooker's sea lions do not appear to be migratory although they disperse widely over their range during the non-breeding season. Some animals can be found at major rookeries and haul-outs year-round. Their activities at sea are little known.

There are no detailed accounts of feeding habits, but Hooker's sea lions take a wide variety of prey, including squid and such demersal species as flounder, octopus, and crustaceans. They are also known to take penguins, and even fur seal and elephant seal pups, on occasion. Some observations suggest they feed continuously while at sea.

**Exploitation:** Prehistoric use of this sea lion was made by the native Maori people of New Zealand. Commercial sealing began in the early 19th Century for hides and oil and continued until stocks were severely depleted by the middle of that century (in less than 50 years). Sporadic commercial sealing activity continued through the second world war, after which commercial sealing was banned in New Zealand. One unusual source of mortality comes from the activities of rabbits introduced by humans, which have excavated burrows near sea lion rookeries. Pups have been known to explore these burrows, become entrapped, and suffocate.

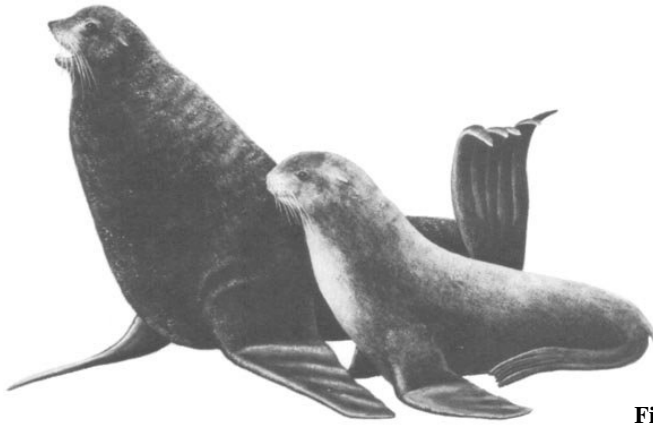
**IUCN Status:** Vulnerable.

***Callorhinus ursinus*** (Linnaeus, 1758)

OTAR Call 1

SEN

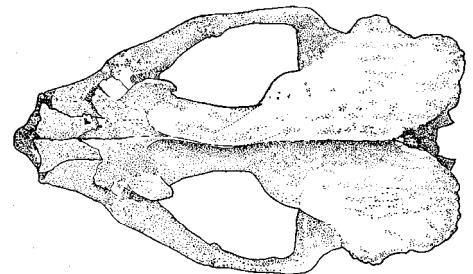
**FAO Names:** En - Northern fur seal; Fr - Otarie des Pribilofs; Sp - Lobo fino del norte.



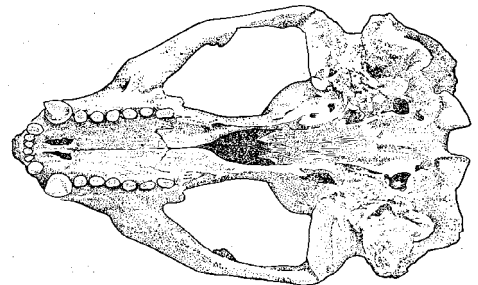
**Fig. 490 *Callorhinus ursinus***

**Distinctive Characteristics:** Adult male northern fur seals have long coarse guard hairs, particularly on the neck, chest, and upper back; females and subadults have shorter, finer guard hairs. Adult females and subadults are moderate in build. It is difficult to distinguish the sexes until about age 5. The neck, chest, and shoulders of adult males are greatly enlarged over those of females and subadults (although those at the end of the breeding season may be thin to the point of emaciation). The head of northern fur seals looks deceptively small because of the very short down-curved muzzle and small nose. The nose extends slightly beyond the mouth in females and moderately in males. Fur is absent on the top of the foreflipper and there is an abrupt look of a "clean shaven line" across the wrist. The hindflippers are about one-fourth of the total body length, the longest in any otariid; they have extremely long, cartilaginous terminal flaps on all of the toes, beyond the position of the nails on the 3 central digits. The ear pinnae are long and conspicuous; in older animals they are naked at the tips. The vibrissae are long, and regularly extend to beyond the ears; they are white in adults. Newborns have black vibrissae that become white by way of "salt and pepper" stages in subadults.

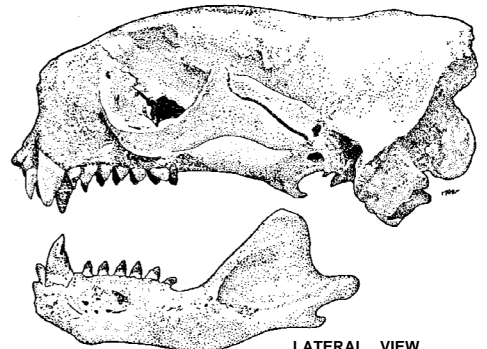
Adult females and subadults are medium to dark silver-grey above. The flanks, chest, sides, and underside of the neck (often forming a "V" pattern in this area) are cream to tan. There are variable cream to tan coloured areas on the sides and top of the muzzle, chin, and as a "brush stroke" running backwards under the eye. The fur of the ear pinnae near the naked tip and the insertion is often pale. Adult males are medium grey to black, or reddish to dark brown all over. The mane can have variable amounts of silver-grey or yellowish tinting on the guard hairs. Pups are blackish at birth, with variable oval areas of buff on the sides in the axillae, and on the chin and sides of the muzzle. After 3 to 4 months, pups moult to the colour of adult females and subadults. The dental formula is I 3/2, C 1/1, PC 6/5.



**DORSAL VIEW**



**VENTRAL VIEW**



**LATERAL VIEW**

**Fig. 491 Skull**

**Can be confused with:** Northern fur seals can be confused with 3 other otariid species in their range: the Guadalupe fur seal (p. 240), and California (p. 230) and Steller (p. 228) sea lions. See the section on the Guadalupe fur seal for distinguishing these 2 fur seals. Northern fur seals can be separated from both sea lions, based on differences in size, pelage, flippers, head and muzzle shape, and relative size and prominence of the ear pinnae.

**Size:** Males can be as large as 2.1 m and 270 kg. Females can be up to 1.5 m and 50 kg or more. Newborns average 5.4 to 6 kg and 60 to 65 cm.

**Geographical Distribution:** Northern fur seals are widely distributed in the waters of the North Pacific Ocean and Bering and Okhotsk Seas. The vast majority of the population breeds on the Pribilof Islands, with smaller numbers on the Commander Islands as well. Rookeries are inhabited in summer and autumn. These oceanic pinnipeds spend most of the year at sea, rarely (if ever) returning to land until the beginning of the next breeding season. Many animals, especially juveniles, migrate south to southern California or the waters off Japan.

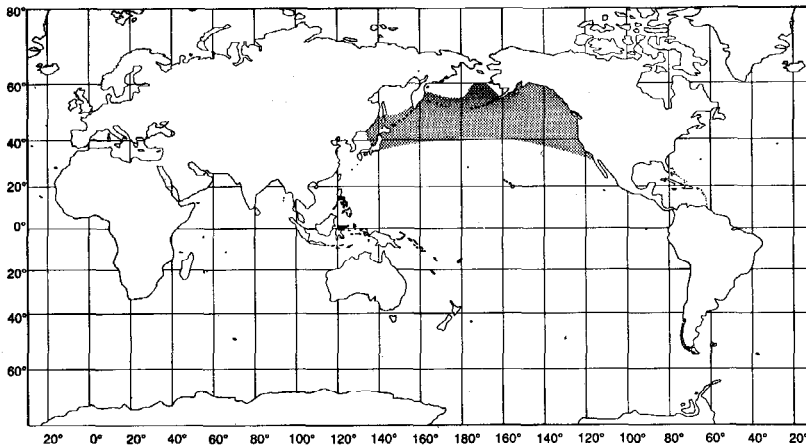


Fig. 492

**Biology and Behaviour:** This is a highly polygynous species. In general, males arrive at the rookeries before females; they fight and display to establish and maintain territories. Breeding on the Pribilof Islands occurs from mid-June through August, with a peak in early July (the median date in southern California is approximately 2 weeks earlier than at the Pribilofs).

At sea, northern fur seals are most likely to be encountered alone or in pairs, but at times in groups of 3 or more. Dive depth has been studied in lactating females and was found to average about 68 m and 2.6 minutes. Northern fur seals spend quite a bit of time rafting at the surface, either asleep or grooming. They employ a wide variety of resting postures, including raising 1 or more flippers into the air, and draping their flippers in a "jug handle" position.

The diet is varied and includes many varieties of epipelagic and vertically migrating mesopelagic schooling and non-schooling fish and squid. They seem to feed mainly at night.

**Exploitation:** Northern fur seals have been exploited by humans in both historic and prehistoric times. Their remains can be found in the middens of many peoples that have lived around the Pacific rim. First discovered by Europeans in 1786, sealing commenced and proceeded with highs and lows, but few periods of no commercial harvesting. All time population lows in the early 20th Century prompted a convention on conservation and led to international cooperation and management and an end to wasteful and destructive pelagic sealing. Commercial sealing ended on Saint Paul Island in the Pribilofs in 1984. A limited subsistence harvest by and for Native Americans continues to this day. The population of northern fur seals has also suffered from the depletion of commercial fish species that are important food resources for seals. They are also thought to be declining at least in part due to mortality from frequent entanglement in nets and debris of all types. All fur seals are susceptible to oil in the water so production and transport of petroleum products offshore creates an ongoing risk from accidents.

**IUCN Status:** Insufficiently known.

***Arctocephalus townsendi*** (Merriam, 1897)

OTAR Arct 2

SGF

**FAO Names:** En - Guadalupe fur seal; Fr - Otarie de Guadalupe; Sp - Lobo fino de Guadalupe.

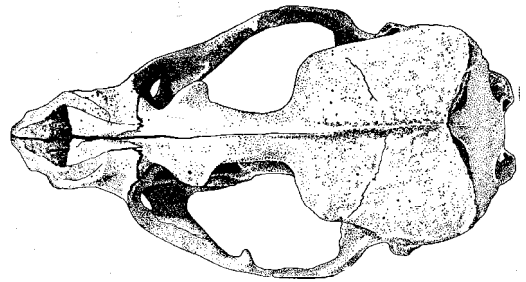


Fig. 493 *Arctocephalus townsendi*

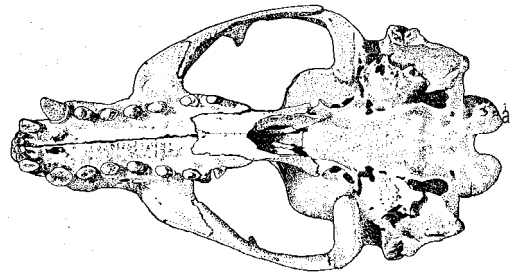
**Distinctive Characteristics:** Guadalupe fur seals have a thick pelage, with dense under-fur. The forehead is flattened to slightly convex. Adults have moderate length whitish cream vibrissae and long prominent ear pinnae. The foreflippers have pelage that covers the black leathery skin on the upper surface, well past the wrist. The hindflippers are moderately long. The toes of the hindflipper are all approximately the same length; the hallux is only slightly wider and thicker than the other digits. Adult males have a very long, flat-topped, pointed muzzle with a large bulbous nose with downward pointing nostrils (they can have a shark-like silhouette). Adult males develop a mane of long coarse guard hairs that cover the neck. This area is also thickened and more muscular in bulls.

Coloration of adult males is dark greyish brown to greyish black. The longer guard hairs of the mane may be light tipped, yielding a greyish grizzled appearance. Much of the head and back of the neck often appears tan to yellowish, whereas the throat and underparts of the neck are darker. Coloration of adult females is dark grey-brown to greyish black above, variably paler below (especially on the chest and underside of the neck, which can be creamy grey). There may be areas of lighter colour on the face.

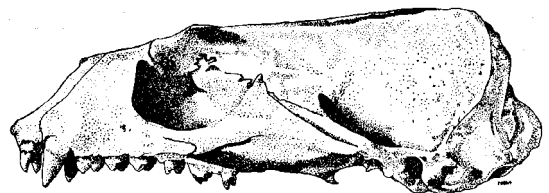
The dental formula is I 312, C 1/1, PC 6/5.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 494 Skull

**Can be confused with:** Three other otariids, the northern fur seal (p. 238) and California (p. 230) and Steller sea lions (p. 228) share the present range of the Guadalupe fur seal. The Guadalupe fur seal can be distinguished from them by head shape, ear size, hindflipper length, and coloration differences. Note the differences between the amount of fur on the foreflippers between Guadalupe and northern fur seals.

**Size:** Two adult males were about 1.8 and 1.9 m in length and the latter specimen was estimated to weigh 160 to 170 kg. Two adult females were about 1.2 and 1.4 m; the latter was estimated to weigh 45 to 55 kg.

**Geographical Distribution:** Guadalupe fur seals have a relatively small core range. At present, the only place they are known to breed is on Guadalupe Island off central Baja California, Mexico. Males are now regularly seen on San Miguel and San Nicolas Islands of southern California. They are also occasionally sighted at sea in the Southern California Bight, and on beaches in central and northern California. The pelagic distribution of this species is unknown. When ashore, Guadalupe fur seals prefer volcanic caves and grottos, or other rocky habitats. The former range of this species was apparently much more extensive.

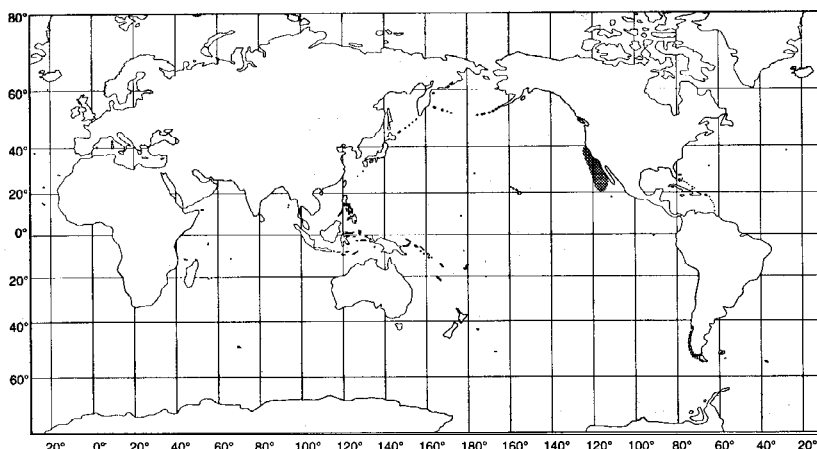


Fig. 495

**Biology and Behaviour:** Breeding and pupping in this species are from mid-June to August; most pups are born from the middle to the end of June. Females with pups and subadults may be seen on or around the island throughout the winter and into the spring.

Knowledge of activities and behaviour at sea, away from Guadalupe Island, are limited to a handful of records. At sea, they appear to be mostly solitary. Observations of animals in captivity suggest that they spend much of their waking time grooming. They raft at the surface to rest in the characteristic "southern fur seal" head-down posture. They also float with 1 or more flippers extended out of the water. When traveling rapidly, they have been observed to porpoise.

Feeding activities and food habits are nearly unknown.

**Exploitation:** Guadalupe fur seals were nearly exterminated by humans in the 19th Century, and by the turn of the century the species was considered extinct. Following the observation of several dozen fur seals on Guadalupe Island in 1926, and the collection of 2 animals for the San Diego Zoo in 1928, none were seen again until 1949 when a lone bull landed on San Nicolas Island. A 1954 search of Guadalupe Island found 14. A count from 1987, yielded 3 259 animals including 998 pups. Guadalupe Island has been a protected pinniped sanctuary since its designation by the Mexican government in 1975. These fur seals are fully protected under Mexican law.

**IUCN Status:** Vulnerable.

***Arctocephalus philippii*** (Peters, 1866)

OTAR Arct 4

SJF

**FAO Names:** **En** - Juan Fernandez fur seal; **Fr** - Otarie de Juan Fernandez; **Sp** - Lobo fino de Juan Fernandez.

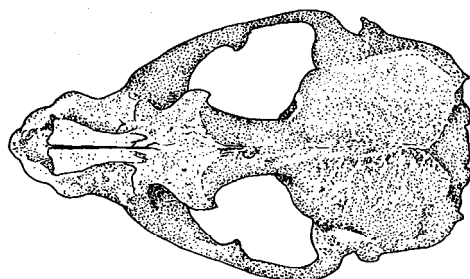


**Fig. 496 *Arctocephalus philippii***

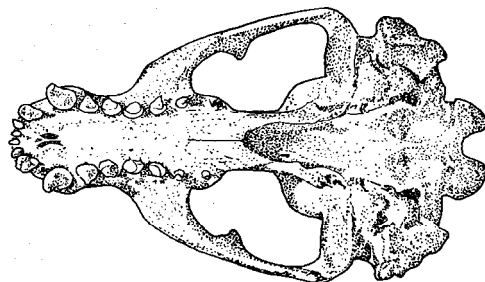
**Distinctive Characteristics:** Juan Fernandez fur seal adults have whitish cream vibrissae and prominent, long ear pinnae. Adult males have a very long, pointed, flat muzzle that may be slightly down-curved at the very end, and which terminates in a large, bulbous, fleshy nose, with downward pointing nostrils. The large size of the nose creates a shark-like silhouette in bulls. The forehead is flat to slightly convex. Adult males develop a mane of long, coarse guard hairs. This area is also thickened and more muscular in bulls. Nearly all adult males are scarred, some heavily. In adult females, the muzzle is long and pointed, and the nose extends beyond the mouth somewhat. The nose is large, but not as bulbous as in adult males. In most aspects, females seem to be typical of other species of the genus.

Adult males are dark blackish brown on the back and belly. The longer guard hairs of the mane are silver-tipped. The crown down to the ears, and nape to the shoulders sometimes appear silver-grey; the throat and neck are darker. Adult females are grey-brown to dark brown above, and variably paler below, especially on the chest and underside of the neck, which can be creamy grey. There may be areas of lighter colour on the face.

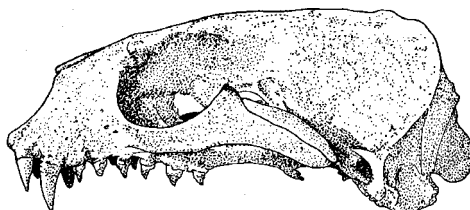
The dental formula is I 3/2, C 1/1, PC 6/5.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

**Fig. 497 Skull**

**Can be confused with:** Among other otariids, the South American (p. 246) Antarctic (p. 252), and subantarctic (p. 250) fur seals, and the South American sea lion (p. 232) have distributions that normally bring them near to that of Juan Fernandez fur seals, but there is no evidence that any of the former 3 species has regularly occurred at the Juan Fernandez Archipelago, nor is there a record for the Juan Fernandez fur seal on the mainland of South America.

**Size:** Adult males are estimated to be 1.5 to 2.1 m in length and weigh 140 to 159 kg. Adult females are estimated to be 1.4 to 1.5 m and 50 kg. Average lengths and weights for newborns are approximately 65 to 68 cm and 6.2 to 6.9 kg.

**Geographical Distribution:** The Juan Fernandez fur seal is restricted to the Juan Fernandez Archipelago in the eastern South Pacific Ocean off Chile and an incompletely known area of surrounding waters. When ashore, these fur seals prefer rocky and volcanic shorelines with boulders, grottos, overhangs, and caves.

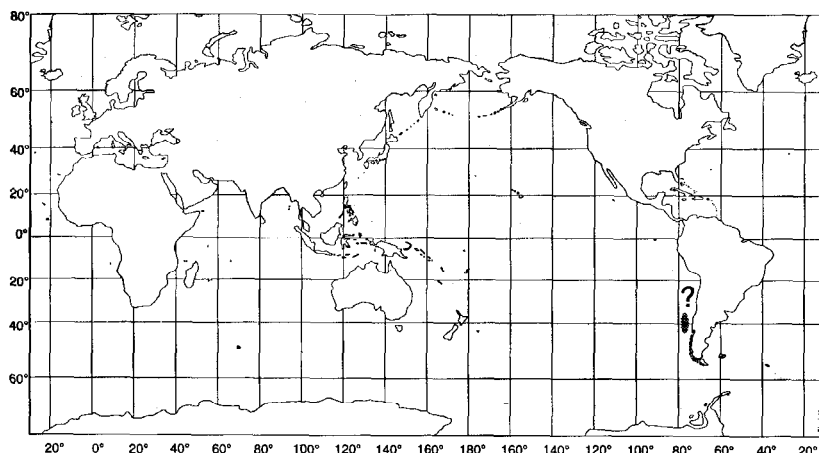


Fig. 498

**Biology and Behaviour:** Breeding in this species is from mid-November to the end of January; most pups are born from late November to early December.

There is no information on migration or diving. At sea, these fur seals can be quite animated at the surface, grooming and resting head down with hindflippers elevated and swaying in the air. They also raft at the surface with flippers tucked in a “jug-handle” position.

The diet of this species is poorly known. Cumulative evidence from stomachs has yielded the remains of 5 varieties of squid. Local fishermen claim that these fur seals also consume various fishes and lobsters.

**Exploitation:** Juan Fernandez fur seals have been severely exploited by humans. Records from sealers' logs, dating from the start of commercial sealing in 1687, account for approximately 4 million seals being taken from these islands. The species was thought to be extinct by 1900. In 1965 a relict population of approximately 200 fur seals were “rediscovered” on Mas Afuera Island.

**IUCN Status:** Vulnerable.



***Arctocephalus galapagoensis*** (Heller, 1904)

OTAR Arct 3

SGA

**FAO Names:** En - Galapagos fur seal; Fr - Otarie des Galapagos; Sp - Lobo fino de Galapagos.

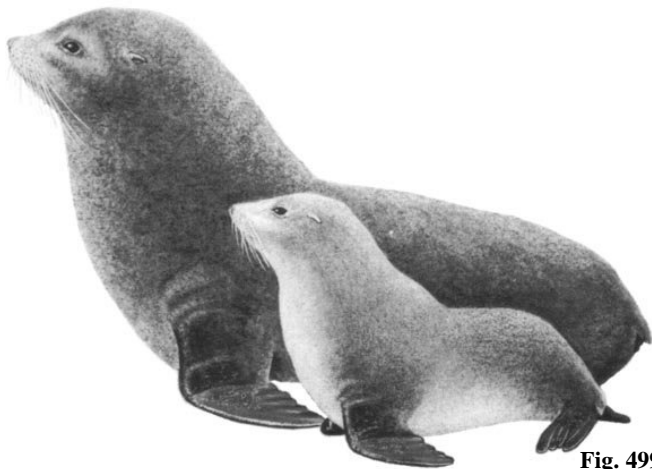
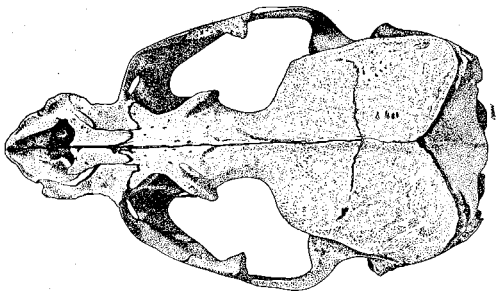


Fig. 499 *Arctocephalus galapagoensis*

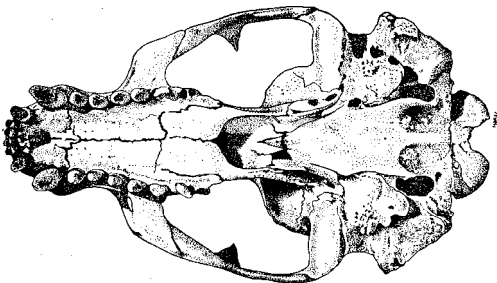
**Distinctive Characteristics:** The Galapagos fur seal is short and compact; with less sexual dimorphism than in other otariids. The flippers are typical for the genus, as are the long, prominent ear pinnae. However, the muzzle is short and pointed, with a small button-like nose, contributing to the flattened look of the end of the muzzle. The eyes appear large. The vibrissae in adults are cream coloured and fairly long. Adult males are much thicker in the neck and shoulders than females, but are not as dramatically different from females as are bulls of other species. A mane of only slightly longer guard hair covers the bull from the shoulders to the top of the head.

Galapagos fur seals are dark brown above, rarely with gold-brown or silver-grey hues. In both sexes, most of the muzzle is pale tan and in adult males, this colour can extend onto the face and forehead over the eyes. In adult females and subadults, the chest is pale greyish tan, sometimes continuing to the back of the neck, and the belly is rusty tan. A variable amount of grizzled lightening can regularly be found on the dark mane of bulls. In both sexes the long ear pinnae and the area of their insertions can be tan. Pups are blackish brown, sometimes with greyish to whitish margins around the mouth and nose. The pups moult this natal coat for one that resembles that of the adult female.

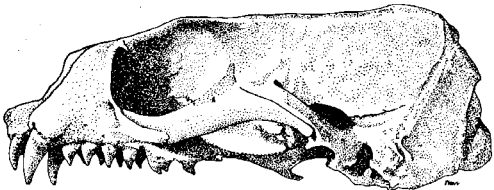
The dental formula is I 3/2, C 1/1, PC 6/5.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 500 Skull

**Can be confused with:** Galapagos fur seals normally share their restricted range in the Galapagos Archipelago only with the Galapagos sea lion (p. 230). The fur seal can be readily distinguished from the sea lion by the former's more pointed muzzle; lighter colour; and toe, ear pinnae, and fur characteristics, as well as the lack of a prominent sagittal crest in males. The South American sea lion (p. 232) has also been recorded as a vagrant in the Galapagos Islands; all of the features described above, plus its much greater size and robust features at nearly all ages, should be useful in distinguishing this species from the Galapagos fur seal.

**Size:** Adult males so far measured have averaged 1.6 m, with weights of 60 to 68 kg. Adult females have shown a range of lengths of 1.1 to 1.3 m and weights of 21.5 to 33 kg. Pups are approximately 4 kg at birth.

**Geographical Distribution:** This species is confined to the vicinity of the Galapagos Archipelago. Most of their rookeries and hauling grounds are found on the western and northern islands, nearest to the areas of oceanic upwelling. The preferred habitat ashore is rocky shores with boulders and lava, under ledges, and in spaces between boulders, where they seek shelter from the sun.

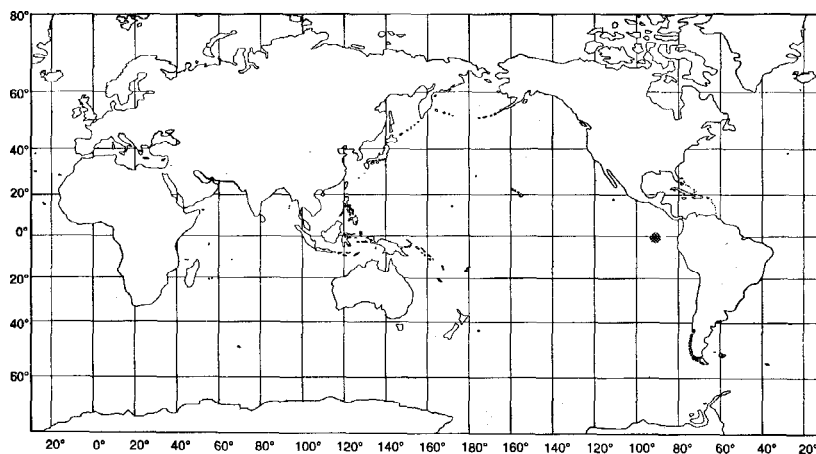


Fig. 501

**Biology and Behaviour:** The behaviour of the Galapagos fur seal has been extensively studied. It has a fairly long pupping and breeding season, lasting from mid-August to mid-November. The peak of pupping shifts from year to year, but usually occurs sometime from the last week of September through the first week of October.

In the water, particularly near haul-outs, Galapagos fur seals raft in postures typical of many of the southern fur seal species. There is no evidence for migration, and they do not seem to spend prolonged periods of time at sea.

Food habits are poorly known. Galapagos fur seals consume a variety of small squid species and several species of schooling fishes. They seem to feed mostly at night, possibly exploiting deep scattering layer organisms when they rise to the surface. They perform short, shallow dives, with an average depth of less than 30 m.

**Exploitation:** There is a legacy of destruction at the hands of humans, as with all fur seals. Whalers and sealers visiting the Galapagos Islands for water and fresh provisions and skins took no fewer than 22 500 during the period 1816 to 1933. The population reached unknown, but presumably low levels, from which it has rebounded since 1940. Today they are fully protected by Ecuadorian law, and benefit from the outstanding management of the islands as a national park and marine reserve.

**IUCN Status:** Insufficiently known.

**Arctocephalus australis** (Zimmerman, 1783)

OTAR Arct 5

SEF

**FAO Names:** En - South American fur seal; Fr - Otarie d'Amérique du Sud; Sp - Lobo fino austral.

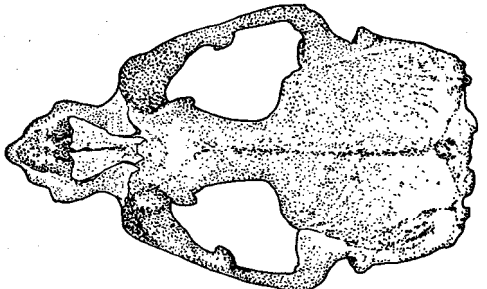


Fig. 502 *Arctocephalus australis*

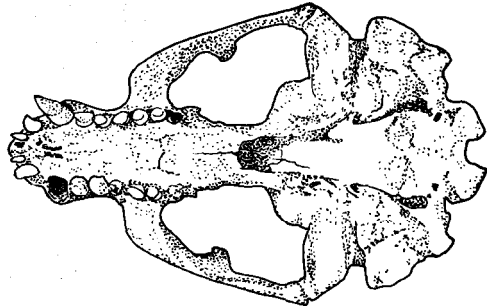
**Distinctive Characteristics:** South American fur seals are stocky, as fur seals go. They have a moderately long, flat-topped, pointed muzzle, with a medium-sized nose. The nostrils are oriented straight ahead, and the nose extends past the mouth. There is a noticeable forehead and rounded crown. The ear pinnae are long and prominent, and the vibrissae of adults are creamy white, and short to moderate in length. Adult males are larger than females, with a proportionately thicker neck and more massive shoulders. Males also develop a mane of longer guard hairs on the head and shoulders.

Adult females and subadults are dark brown to greyish black above and paler, often mixed rusty brown, tan, and greyish, below. A band of light colour wraps around the lower neck, but darkens toward the top. The head is dark, but the muzzle is sometimes partly greyish tan. Lighter areas often surround and highlight the greyish tan ears, particularly in adult females and older subadults. The fur on the top of the flippers is generally quite dark. As they age, males darken and become more uniformly coloured, generally dark brown, with grey to yellowish tan grizzled frosting. Some bulls are paler. At birth, pups are dark, but there may be some paler markings on the face and muzzle, and some animals are paler below.

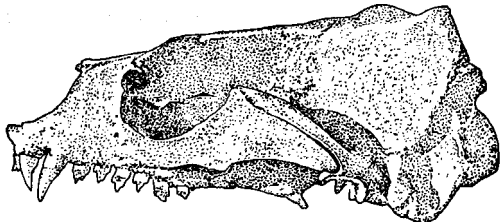
The dental formula is I 3/2, C 1/1, PC 6/5.



DORSAL VIEW



VENTRAL VIEW



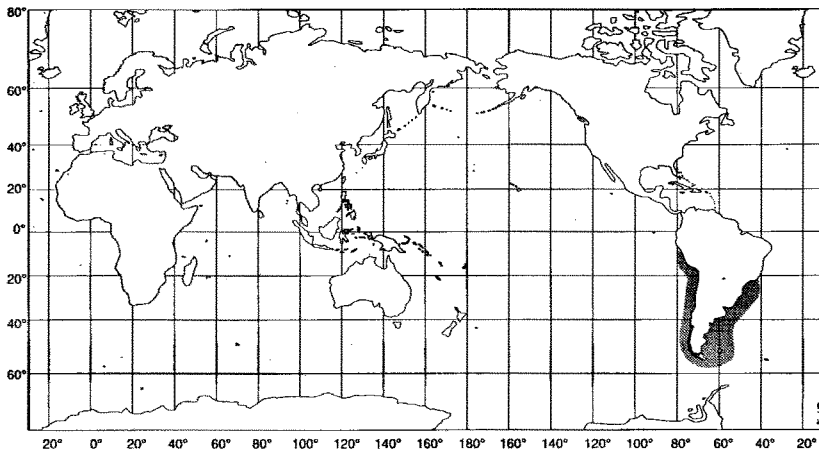
LATERAL VIEW

Fig. 503 Skull

**Can be confused with:** At least 6 other otariids can be found within the range of the South American fur seal: Juan Fernandez (p. 242), Antarctic (p. 252), subantarctic (p. 250), and Galapagos (p. 244) fur seals, and South American (p. 232) and Galapagos (p. 230) sea lions. See the section on the Juan Fernandez fur seal for distinguishing that species from South American fur seals. Subantarctic fur seals are comparable to South American fur seals in length and weight, but have a unique colour pattern on the chest and head, and (in males) a tuft of longer prominent guard hairs on the crown. Antarctic fur seals are smaller and lighter overall as adults, with a shorter muzzle, and often longer and more conspicuous creamy white vibrissae and a more grizzled coat. Galapagos fur seals are much smaller, with a muzzle that, in comparison to that of South American fur seal, is very short and blunt.

**Size:** Adult males reach 1.9 m and 120 to 200 kg, females are about 1.4 m and 40 to 50 kg. Newborns are 60 to 65 cm and 3.5 to 5.5 kg.

**Geographical Distribution:** South American fur seals are widely distributed from central Peru, around the southern tip of the continent, and up to southern Brazil. They also occur around the Falkland Islands. Distribution at sea is poorly known. These seals are thought to use primarily coastal, continental shelf and slope waters; however, there are records from more than 600 km offshore.



**Fig. 504**

**Biology and Behaviour:** Breeding take place from mid-October through mid-December. Males are territorial, and fighting can result in dramatic wounds and scars.

No migration is known and colonies on islands off Uruguay are occupied by portions of the population year-round. At sea, these fur seals may be seen rafting at the surface, with head down and flippers waving in the air. They frequently groom while at the surface. Groups of 15 to 20 animals have been seen traveling together offshore.

The diet is poorly documented, but includes a variety of small schooling fishes and invertebrates, such as cephalopods, crustaceans, and gastropods.

**Exploitation:** There is a long history of human exploitation of South American fur seals. Native peoples, particularly those of the Tierra del Fuego region depended heavily on pinnipeds for food and skins. Exploitation by Europeans goes back to the 16th Century and sealing for skins and oil was heavily pursued in the late 18th and early 19th Centuries in many parts of the species' range. Although commercial sealing has been discontinued elsewhere for these animals, it continues to this day in Uruguay and is the longest running sealing operation in the world. Fur seals are taken incidentally in fishing operations and by poaching throughout their range, particularly in Peru. Some are taken in Chile for use as bait in crab traps. Overfishing of prey species probably acts to limit population growth in some areas.

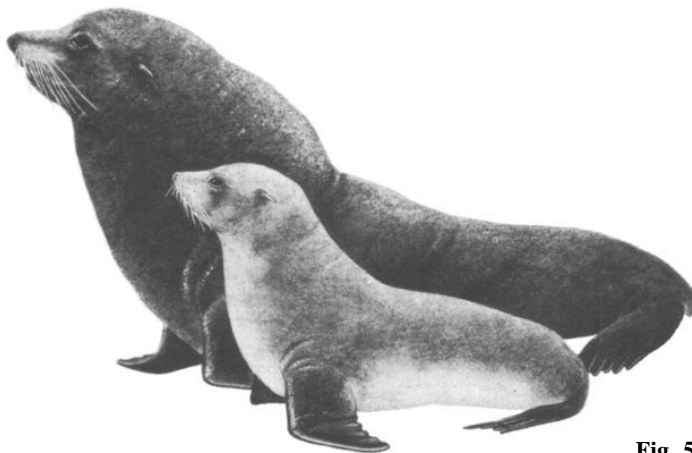
**IUCN Status:** Insufficiently known.

***Arctocephalus forsteri*** (Lesson, 1828)

OTAR Arct 6

SNZ

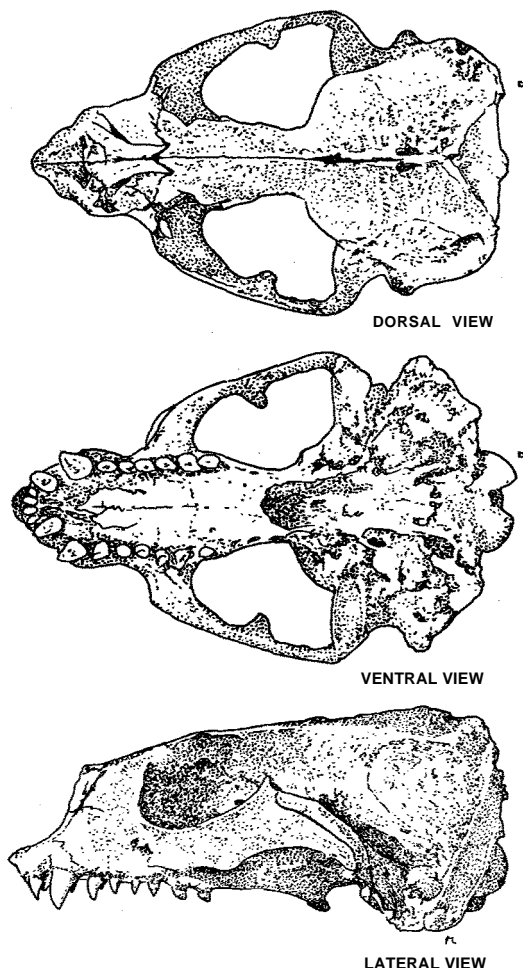
**FAO Names:**En - New Zealand fur seal; Fr - Otarie de Nouvelle-Zélande; Sp - Lobo fino de Nueva Zelandia.

Fig. 505 *Arctocephalus forsteri*

**Distinctive Characteristics:** New Zealand fur seals have rather generic southern fur seal features. The muzzle is moderately long, flat, and pointed, with a fleshy, somewhat bulbous nose that extends past the mouth and ends in nostrils that point ahead with a slight down angle. In adults, the vibrissae are cream to white and of medium length, reaching to about the ear. The flippers are of medium length, with the characteristic hindflipper toe configuration. The ears are long and prominent. The head of pups is rounded in profile. Adult males develop a mane of elongated, coarse guard hairs, which cover a thickened neck, chest, and shoulders. The nose is larger and more bulbous in adult males than in females.

Adult males are dark brownish grey above and paler below. In paler animals, the tops of the flippers are usually a contrasting darker brown. There is a grizzling of white, which creates a silvery sheen on dry animals. The muzzle is paler, grey to rusty tan. So, too, are the ear pinnae and the area around their insertions. Adult females are generally paler on the underside of the neck and chest. Pups are blackish, except for a whitish muzzle. They moult to adult pelage at 2 to 3 months.

The dental formula is  $I\ 3/2$ ,  $C\ 1/1$ ,  $PC\ 6/5$ .



LATERAL VIEW

Fig. 506 Skull

**Can be confused with:** New Zealand fur seals share their range with a number of other otariids, including Antarctic (p. 252), subantarctic (p. 250), and Australian (p. 254) fur seals, and Hooker's (p. 236) and Australian (p. 234) sea lions. Shape of the head and muzzle, presence of a dense underfur, coloration, size and prominence of ear pinnae, and length of the toes on the hindflipper readily distinguish New Zealand fur seals from both sea lions. Separating the fur seal species is more difficult and may be problematic for subadults and females. Generally, note the length of the muzzle and size of the nose, coloration (especially of the front of the body), prominence and coloration of the ear pinnae, and relative lengths of the flippers.

**Size:** Adult males are up to 2 m and 120 to 200 kg, females 1.5 m and 30 to 50 kg. Pups average 3.3 to 3.9 kg and 40 to 55 cm at birth.

**Geographical Distribution:** New Zealand fur seals are distributed in 2 geographically isolated populations. In New Zealand, they occur around both the North and South Islands, with rookeries south and west to all of New Zealand's subantarctic islands. They are present, but do not breed, on Macquarie Island. A separate population also occurs on offshore islands in southern and western Australia. New Zealand fur seals prefer rocky habitat with shelter, particularly on locations more exposed to wind and weather; they readily enter vegetation. Little is known of distribution at sea, although they apparently prefer waters of the continental shelf and slope.

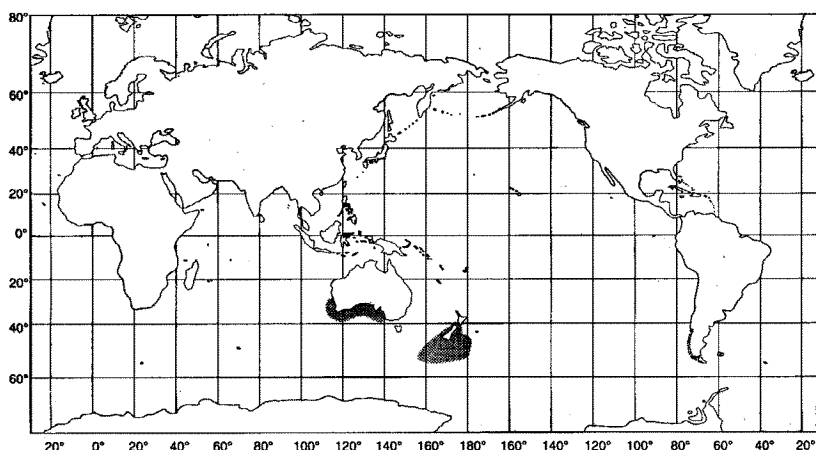


Fig. 507

**Biology and Behaviour:** Breeding occur from mid-November to January. Most pups are born from late November to mid-December. The number of animals ashore at rookeries declines rapidly in January. New Zealand fur seals are considered non-migratory. At sea they actively groom and raft in a variety of postures.

New Zealand fur seals appear to feed mainly at night. Diet includes a wide variety of pelagic near-surface fishes and squids, and benthic prey, particularly octopuses. They occasionally feed on penguins and other marine birds.

**Exploitation:** Prehistoric hunting was pursued by native peoples of Australia and New Zealand. Commercial sealing by Europeans was carried out in earnest in the early 19th Century and the population of these fur seals in New Zealand, Australia and the subantarctic was drastically reduced and whole colonies were wiped out. There have been sporadic culls as numbers rebounded in the 20th Century. At present, New Zealand fur seals are protected throughout their range by New Zealand and Australian laws. Threats today include entanglement in fishing gear and debris and the potential depletion of their food resource base due to intensive commercial harvesting of fish and squid.

**IUCN Status:** Insufficiently known.

***Arctocephalus tropicalis* (Gray, 1872)**

OTAR Arct 7

SSF

**FAO Names:** En - Subantarctic fur seal; Fr - Otarie sub-antarctique; Sp - Lobo fino de subantarctico.

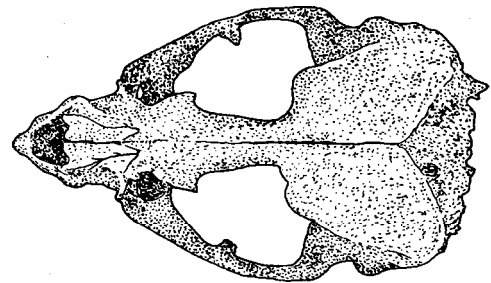


Fig. 508 *Arctocephalus tropicalis*

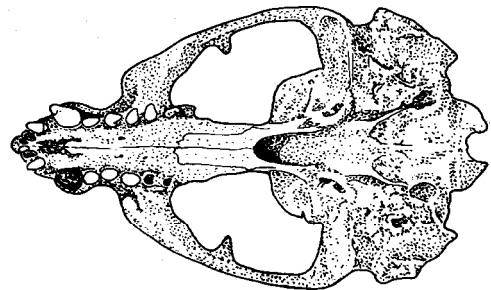
**Distinctive Characteristics:** In both sexes, the muzzle is moderate to short, flat, and somewhat pointed, with a non-bulbous nose and forward pointing nostrils. The vibrissae are very long, often reaching past the ears and well down the chest. The long ear pinnae, with naked tips, lie close to the head and are not particularly prominent. The flippers are proportionately short and broad. Adult males are heavily built; their enlarged chest and shoulders make the neck appear short. They develop a prominent tuft, or crest, of long guard hairs on top of the head, and a thick mane. In adult females, the mane and crest are absent, but the fur is generally longest on the chest and neck. Adult females have a blunt, broad muzzle.

Subantarctic fur seals are strikingly marked. In adult males, the back colour varies from greyish or orangish brown to charcoal (males become increasingly grizzled with age). There is often a dark band between the flippers, but the rest of the belly is a lighter brown. Adult females are usually lighter grey on the back than are bulls. In both sexes, the colour of the chest, muzzle, and face (to the ears and above the eyes) is cream to burnt orange. The tops of the flippers and the area around their insertions are brown, usually darker than the rest of the back (although, sometimes paler in bulls). The dark colour on the head sometimes comes to a forward-facing point on the muzzle. The naked ear tips are usually dark.

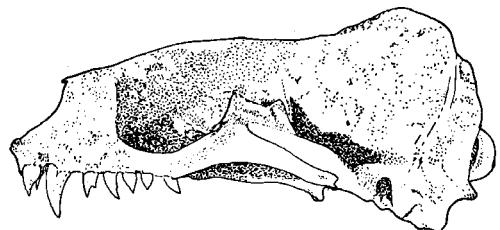
The dental formula is I 3/2, C 1/1, PC 6/5.



DORSAL VIEW



VENTRAL VIEW



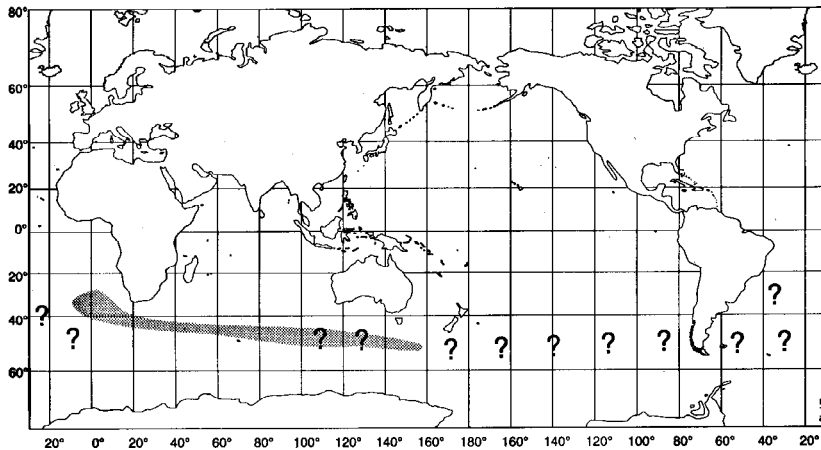
LATERAL VIEW

Fig. 509 Skull

**Can be confused with:** Subantarctic fur seals co-occur with Antarctic (p. 252), South American (p. 246), South African-Australian (p. 254), New Zealand (p. 248), and Juan Fernandez (p. 242) fur seals, and South American sea lions (p. 232). Distinguishing fur seals may be problematic, except for adult males, but note size, coloration; muzzle length, size of nose, relative flipper size, and vibrissae colour and length.

**Size:** Adult males are up to 1.8 m long and weigh 70 to 165 kg, females 1.4 m and 25 to 55 kg. Newborns are about 60 cm and 4 to 4.4 kg.

**Geographical Distribution:** Subantarctic fur seals are widely distributed in the Southern Hemisphere. They breed on many subantarctic islands north of the Antarctic Convergence. The northern limit of their range is not well known, but vagrants have appeared in South Africa, Argentina, Brazil, Australia, and the Juan Fernandez Islands. Subantarctic fur seals have also been recorded south of the convergence at South Georgia. When ashore; these seals prefer rough, rocky terrain.



**Fig. 510**

**Biology and Behaviour:** Subantarctic fur seals pup and breed from late October to early January, with a peak in mid-December. Seals also are ashore for the annual moult between February and April, with a peak in March and April.

Little is known of their behaviour while at sea. Except for cows with pups, most of the population spends much of the winter and spring (June-September) at sea.

Diet varies by location and season, with fish, squid, penguins, and krill predominating.

**Exploitation:** Subantarctic fur seals were heavily hunted in the late 18th and 19th Centuries. Breeding groups on most islands were hunted out and the seals disappeared from a number of localities. Most colonies are experiencing rapid growth at present.

**IUCN Status:** Insufficiently known.



**Arctocephalus gazella** (Peters, 1875)

OTAR Arct 1

SEA

**FAO Names:** En - Antarctic fur seal; Fr - Otarie antarctique; Sp - Lobo fino antartico.



Fig. 511 *Arctocephalus gazella*

**Distinctive Characteristics:** The muzzle is s and moderately pointed. The nose does not extend much past the mouth, is not bulbous, and the nostrils point ahead. The ear pinnae are long, prominent, and naked at the tip. The creamy white vibrissae of adults are very long, particularly in bulls; some are the longest of any pinniped (up to 35 to 50 cm). The foreflippers are about one-third, and hindflippers slightly more than one-fourth, the total length. Adult males develop a mane on the chest, neck, and top of the head. There is an enlargement of this area with muscle and fat that occurs with maturity.

Adult females and subadults are medium grey, occasionally darker above, and paler below. There is usually a pale blaze on the flanks, extending towards the hindflippers. The chest and underside of the neck are palest; this pale colour extends onto the sides and back of the neck. The muzzle and face are also marked with lighter areas. Additional lighter areas often surround and highlight the ears, particularly in adult females and subadults. The tops of the flippers are generally darker than the back. At birth, pups are blackish, though they may be pale on the face and muzzle, and some animals are paler below. Adult males are dark greyish brown to charcoal, with frosting on the guard hairs of the back, mane, and flanks (these guard hairs often bunch up and reveal the fawn coloured underfur).

There is an unusual pale (yellowish off-white to honey) form of the Antarctic fur seal that occurs infrequently.

The dental formula is I 3/2, C 1/1, PC 6/5.

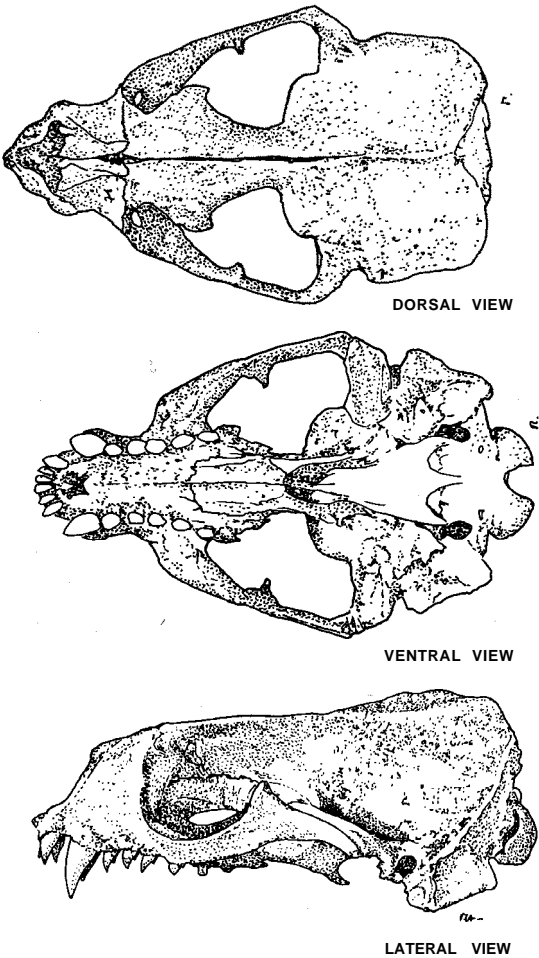


Fig. 512 Skull

**Can be confused with:** Antarctic fur seals might be confused with many southern otariids, most notably: subantarctic (p. 250), South American (p. 246), Juan Fernandez (p. 242), South African (p. 254), and New Zealand (p. 248) fur seals, and South American (p. 232) and Hooker's (p. 236) sea lions. To distinguish bulls of the different fur seals, note overall size, characteristics of the muzzle and nose, coloration, relative length of the flippers, and length of the vibrissae (keeping in mind that vibrissae may be broken off). In some cases, it may not be possible to separate adult female and subadult fur seals. Most useful are body shape, coloration, vibrissae, ear size, eye shape, and flipper size and shape.

**Size:** Adult males are up to 2 m long and weigh 110 to 230 kg, females up to 1.4 m and 22 to 51 kg. Newborns are about 63 to 67 cm and 6 to 7 kg.

**Geographical Distribution:** Antarctic fur seals are widely distributed in waters south, and in some areas slightly north, of the Antarctic Convergence. They breed and haul out on many islands in this region, from the Antarctic Peninsula west to Macquarie Island and South Georgia. Ashore, they prefer rocky habitats, but readily haul out on sandy beaches and move into such vegetation as tussock grass. They can be found far out to sea. In winter, males and subadults occur south to the edge of the consolidated pack ice, and can be found hauled-out on sea ice.

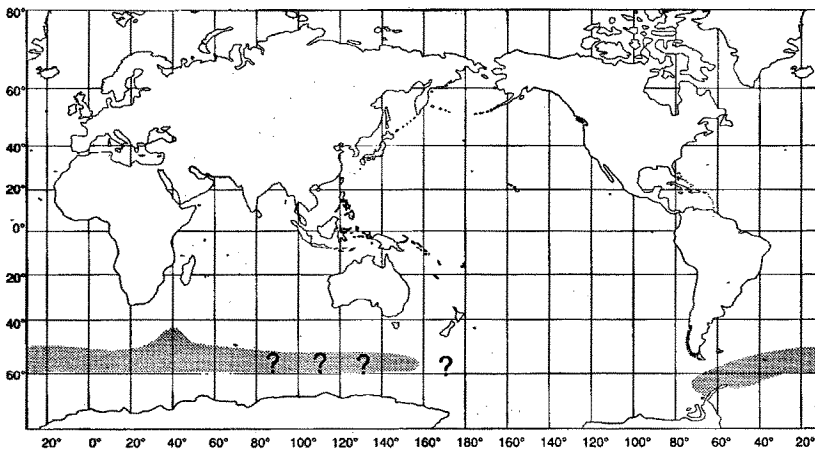


Fig. 513

**Biology and Behaviour:** Breeding is from late November to late December. After they mate and wean their pups, females disperse widely, possibly migrating north. Bulls also depart breeding areas, but subadults and adults can be seen around the rookeries at South Georgia all year. Like other fur seals, Antarctic fur seals porpoise when swimming rapidly. When rafting they often assume the typical fur seal resting posture. At other times, they can be found busily engaged in grooming.

Antarctic fur seals, especially adult females, feed heavily on krill, but also take fish in summer. Dietary patterns of females in summer indicate nocturnal feeding.

**Exploitation:** This species was nearly exterminated by sealers. Harvesting occurred with numerous highs and lows in activity from the late 18th until the early 20th Century. Estimates are that only a few hundred may have survived. Rapid population growth occurred from 1958 to 1972 and slower but continuous growth from that point until the present. Although the population of Antarctic fur seals is still growing, entanglement of these seals in debris at a rate of 0.1 to 1% at South Georgia may become a factor in the stability of this species.

**IUCN Status:** Insufficiently known.

***Arctocephalus pusillus*** (Schreber, 1776)

OTAR Arct 8

SEK

**FAO Names:** *A. p. pusillus*: **En** - South African fur seal; **Fr** - Otarie du Cap; **Sp** - Lobo marino de dos pelos de Sudafrica. *A. p. doriferus*: **En** - Australian fur seal; **Fr** - Otarie d'Australie; **Sp** - Lobo fino de Australia.

Fig. 514 *Arctocephalus pusillus*

**Distinctive Characteristics:** These are the largest fur seals. The head is large and wide, and the muzzle is robust (the most "sea lion-like" of any fur seal). The muzzle is pointed and flat to slightly upturned, most conspicuously in subadult males. It extends well past the mouth and ends in a bulbous fleshy nose (more heavily developed in males). The ear pinnae are long and prominent. The vibrissae are moderately long, regularly reaching past the ears.

Adults are greyish to brown; South African seals are generally darker than those from Australia. The guard hairs have a grizzled appearance. Males initially darken with age. Then as adults, the mane becomes light coloured. Females can also be lighter in the chest region, but less so than in males. The muzzle, lower jaw, and face are paler. The tops of the flippers are very dark. The ear pinnae and their insertions are frequently paler. Adult females and subadults are paler below, especially on the chest and underside of the neck. Pups are blackish, with variable hints of silver overall. They first moult at 4 to 5 months to an olive grey coat. As juveniles, they moult a year later into a silvery grey coat.

The dental formula is I 3/2, C 1/1, PC 6/5.

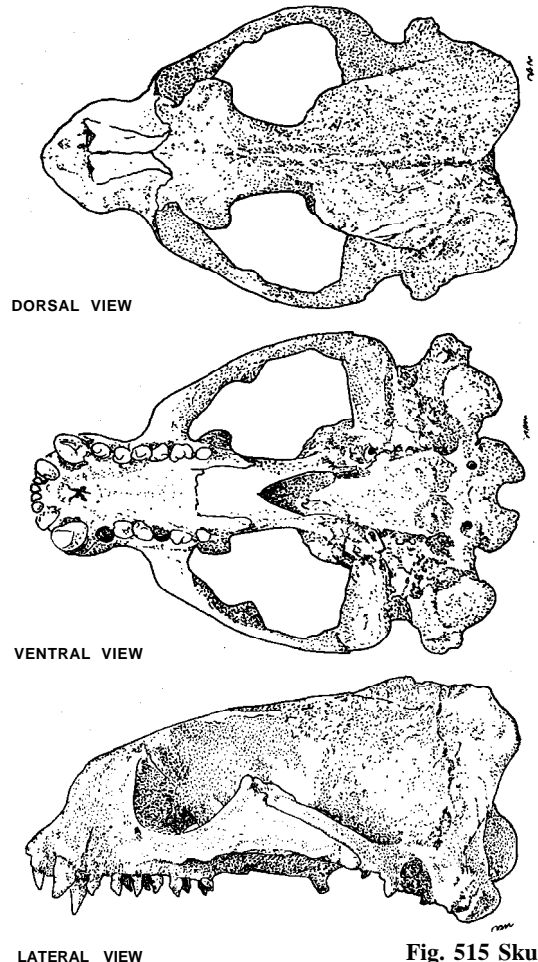
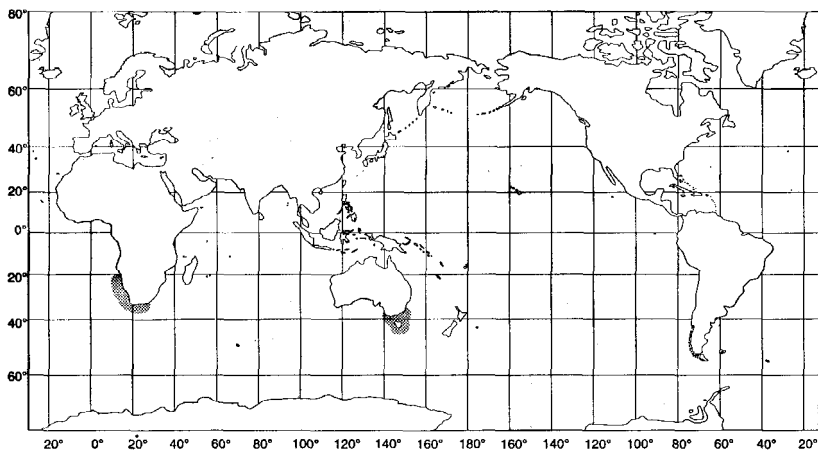


Fig. 515 Skull

**Can be confused with:** South African and Australian fur seals share their range with a number of vagrant or wandering otariid species. Of these, they may be confused with Antarctic (p. 252), subantarctic (p. 250), and New Zealand (p. 248) fur seals, and Australian sea lions (p. 234). The most important features are overall size, coloration, head and muzzle size and shape, proportional length of flippers, and size and prominence of ear pinnae. Differentiating subadult and female fur seals may be very difficult. The Australian race of this fur seal should be readily separable from the Australian sea lion.

**Size:** Adult males are up to 2.3 m long and weigh 200 to 360 kg, females to 1.8 m and 41 to 120 kg. Newborns are about 60 to 70 cm and 4.5 to 7 kg (South African) or 80 cm and 12.5 kg (Australian).

**Geographical Distribution:** South African fur seals (*A. p. pusillus*) are found along the south and south-western coasts of Africa from South Africa to Angola. Australian fur seals (*A. p. doriferus*) are found along the coast and continental shelf and slope waters from Victoria, along southern New South Wales, including Tasmania, and the islands of Bass Strait. They range up to 160 km offshore. On land, they have a decided preference for rocky habitat.



**Fig. 516**

**Biology and Behaviour:** Breeding is from late October to the beginning of January. The peak is in the first week of December, although there is some variation between colonies. At sea, these seals are found alone or in small groups of up to 15 animals, and often in huge rafts or herds adjacent to rookeries. They adopt a variety of postures while resting in the water, including the "jug-handle." These fur seals also purposely entangle themselves in rafts of kelp, possibly using the kelp as an anchor and for camouflage. When traveling rapidly, they sometimes porpoise. Neither of the populations is migratory; they move more locally within their restricted ranges.

These fur seals are opportunistic feeders that take a wide variety of prey, including pelagic, mid-water, and benthic animals, such as schooling and solitary fish, cephalopods, and crustaceans. They can dive to at least 200 m and are thought to feed most often during the day.

**Exploitation:** Commercial sealing began off southern Africa in the early 17th Century, and in the late 18th Century off Australia. By the late 19th Century both populations had been severely depleted. At about this time fur seals became partially protected in Australia, with hunting fully halted there in the 1970s. The government in South Africa took control and managed the sealing in the late 19th Century; however, it continues to this day.

**IUCN Status:** Insufficiently known.

***Odobenus rosmarus*** (Linnaeus, 1758)

ODOB Odob 1

WAL

FAO Names: En - Walrus; Fr - Morse; Sp - Morsa.

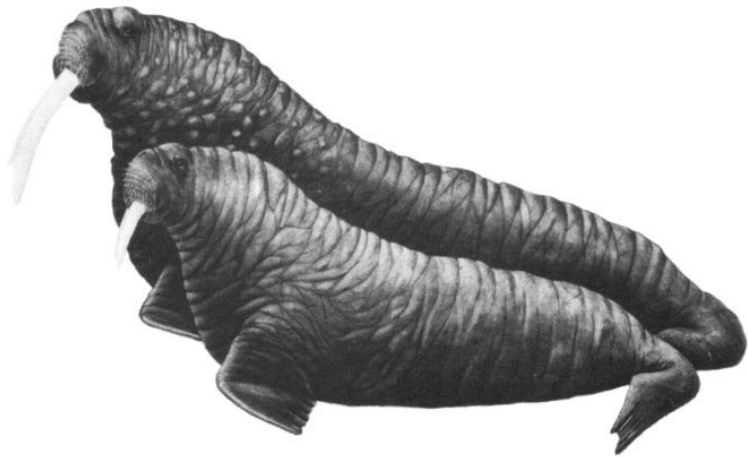


Fig. 517 *Odobenus rosmarus*

**Distinctive Characteristics:** Walruses are very large and bulky animals. Males are longer and heavier than females. Adults have a short coarse pelage that grows sparser in older males than in females. The skin is thick, rough, and heavily marked with creases and folds. Older males often have lumps or nodules on the neck and chest, giving them a warty appearance. The neck, chest, and shoulders are massive, and the body tapers towards the tail. The head, and especially the muzzle, are short, but very wide. The “bloodshot” eyes are small, somewhat protruding, and set far apart. The end of the muzzle is flattened and has large, fleshy, forward-facing mystacial pads sprouting several hundred short, stiff, whitish vibrissae. The nostrils are located on top of the muzzle. Walruses have no ear pinnae. The foreflippers are relatively short and squarish; in some ways they resemble otariid foreflippers, with longer first digits and shorter subsequent digits, each with a very weakly developed claw. The hindflippers are phocid-like, with longer first and fifth digits, and strong expandable webbing between the digits, each with a small claw. The tail is enclosed in a web of skin.

Walrus coloration varies with age and activity. Most walruses are greyish cinnamon-brown. Males become paler as they age; some old bulls look albinistic. When walruses enter cold water they become paler still, as blood flow to the skin is reduced. Conversely, when these animals are warm, the skin becomes flushed with blood and they acquire a rosy red “sunburned” colour. Subadult animals tend to be darker, with almost black skin.

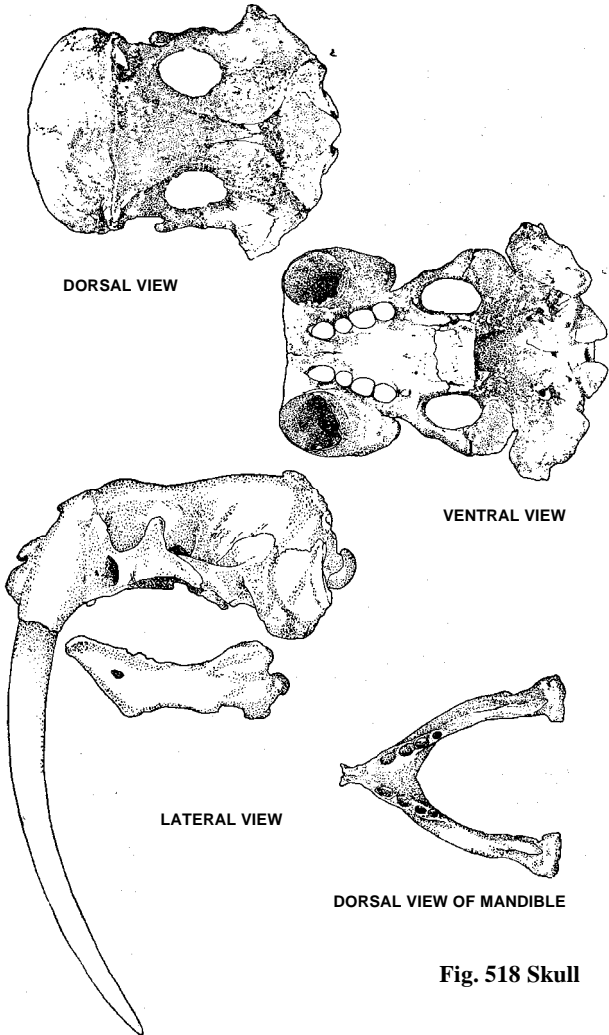


Fig. 518 Skull

The dental formula is I 1/0, C 1/1, PC 3/3. The upper canine teeth develop into tusks that grow throughout life; they are longer (up to 1 m total length) and thicker in males than in females (although they often are partially, or entirely, broken off in adults of both sexes). Tusks also tend to be less curved and more divergent at the tips in males. Walrus calves are born without tusks, but they erupt at an early age.

**Can be confused with:** Walruses are unmistakable, and should not be confused with any other animal.

**Size:** Males reach about 3.6 m and 1 900 kg, females about 3 m and 1 200 kg. Newborns are 1 to 1.2 m and weigh 45 to 75 kg.

**Geographical Distribution:** Walruses have a nearly circumpolar distribution in the Arctic. Three distinct subspecific populations are recognized: Atlantic, *O. rosmarus rosmarus*, from the eastern Canadian Arctic, and Greenland east to Novaya Zemlya; Pacific, *O. r. divergens*, in the Bering Sea and adjacent Arctic Ocean, and; *O. r. laptevi*, from the Laptev sea, north of Siberia (although this subspecies is not recognized by most taxonomists). Walruses are found in shallow water and coastal habitats, usually associated with pack ice. They regularly haul out on sandy beaches, rocky shores, and ice floes to rest and moult.

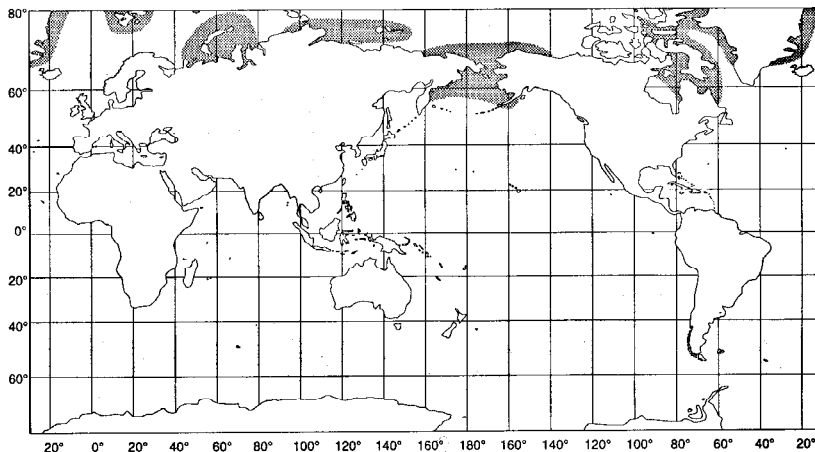


Fig. 519

**Biology and Behavior:** Calves are born from mid-April to mid-June on pack ice. Courtship and mating has been little studied, because walruses mate in the harsh winter environment of the Arctic. It is believed that walruses are polygynous and that males may form a type of lek; they seem to establish small aquatic territories adjacent to females hauled out on ice floes, where they vigorously vocalize and display. There is also some intense male-male fighting at this time.

In most populations walruses generally follow the movements of the pack ice. However, some walruses summer far from the pack ice, such as on Round Island, Alaska. Walruses also haul out on shore, away from ice in years of reduced pack ice. Walruses are among the most gregarious of pinnipeds. Ashore they are regularly found in huddled masses; at sea they are often seen in groups of less than 10.

Tusks are used for hauling out, and in social interactions, not for digging up food, as previously thought. Walruses feed on a wide variety of prey, chiefly benthic invertebrates. Some of the favourite foods are clams, worms, snails, shrimp, and slow-moving fish. Some "rogues" regularly prey on seals and small whales.

**Exploitation:** Walruses have been severely exploited by humans. Like most Arctic pinnipeds, they have been hunted for millennia by native peoples who made wide use of the carcass for meat, skins for shelter and kayak coverings, and ivory for tools, weapons, and art. Europeans have taken vast numbers of these animals beginning with Viking traders in the 10th Century. Most populations were decimated in the 19th and early 20th Centuries. Although the Pacific population has recovered dramatically, the Atlantic and Laptev Sea populations are still at low levels. Subsistence catches are still important to northern cultures. These are managed by governments, but poaching continues to be a problem in most areas.

**IUCN Status:** Insufficiently known.

***Phoca vitulina*** (Linnaeus, 1758)

PHOC Phoca 1

SEC

FAO Names: En - Harbour seal; Fr - Phoque veau marin; Sp - Foca común.

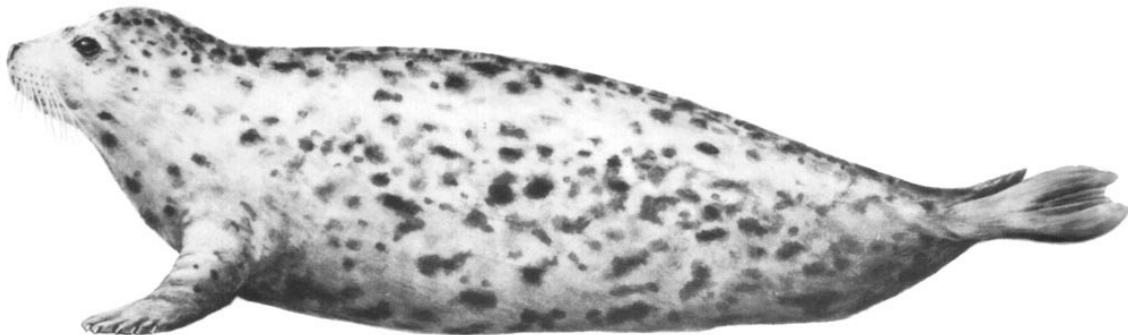
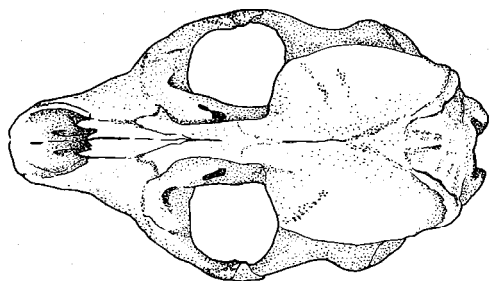


Fig. 521 *Phoca vitulina*

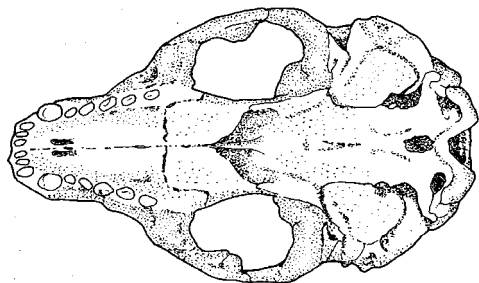
**Distinctive Characteristics:** The taxonomy of the harbour seal is controversial, but most workers refer to 4 or 5 subspecies (described below). The body is plump and the head is small and cat-like, with a slight forehead. The nostrils are small and terminal, forming a "V" that converges at the bottom. The eyes are relatively large and set close together. The external ear openings are relatively large and conspicuous, and are set slightly behind and below the eyes. Prominent, light-coloured, beaded vibrissae are characteristic of harbour seals. harbour seals are not obviously sexually dimorphic, and it is extremely difficult to tell the sexes apart. The flippers are relatively short, only about one-fifth to one-sixth of standard length; they have long, thin, hooked claws on all digits. The ends of the foreflippers are somewhat squared off.

The most conspicuous feature of the variably coloured coat is the presence of many fine spots, ring-like markings, and some blotches. The markings are usually scattered liberally over the body, but with fewer below than above. The most common base pattern is a light to dark grey or brown back, lightening to a paler belly (although some animals are uniformly coloured). In some localities, a few animals have a rust-coloured tinge, primarily on the head and upper body. Pups usually shed their silvery grey lanugo in the uterus (others may retain this lanugo for several weeks after birth).

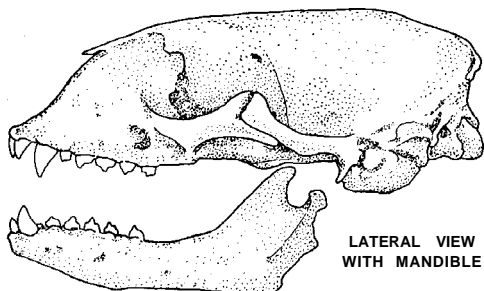
The dental formula is I 3/2, C 1/1, PC 5/5.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW  
WITH MANDIBLE

Fig. 520 Skull

**Can be confused with:** Eight other phocids share the range with 1 or more subspecies of harbour seal, presenting one of the most challenging identification problems among the pinnipeds. Features for distinguishing harbour seals from northern elephant (p. 284), grey (p. 272), and hooded (p. 276) seals are given in their respective species accounts. In the North Pacific, the Larga seal (p. 260) poses the most difficult identification problem. Details of the colour pattern provide the best clues for distinguishing them from the 2 Pacific subspecies of harbour seal. However, it should be noted that separating harbour and Larga seals may not always be possible.

**Size:** Adult males are up to 1.9 m long and weigh 70 to 150 kg, females 1.7 m and 60 to 110 kg. At birth, pups are 65 to 100 cm and 8 to 12 kg.

**Geographical Distribution:** Harbour seals are one of the most widespread of the pinnipeds. They are confined to the Northern Hemisphere, from temperate to polar regions. At least 4 subspecies are recognized: *P. vitulina vitulina* in the eastern Atlantic from northern Portugal to the Arctic, including Iceland and Greenland; *P. v. concolor* in the western Atlantic from the mid-Atlantic United States to the Canadian Arctic; *P. v. richardsi* in the eastern Pacific from central Baja California, Mexico to the eastern Aleutian Islands, and; *P. v. stejnegeri* in the western Pacific from Japan to the Kamchatka Peninsula. At sea, these non-migratory seals are mainly found in coastal waters of the continental shelf and slope. They haul out and breed on beaches and low-lying rocks, terraces, and ice.

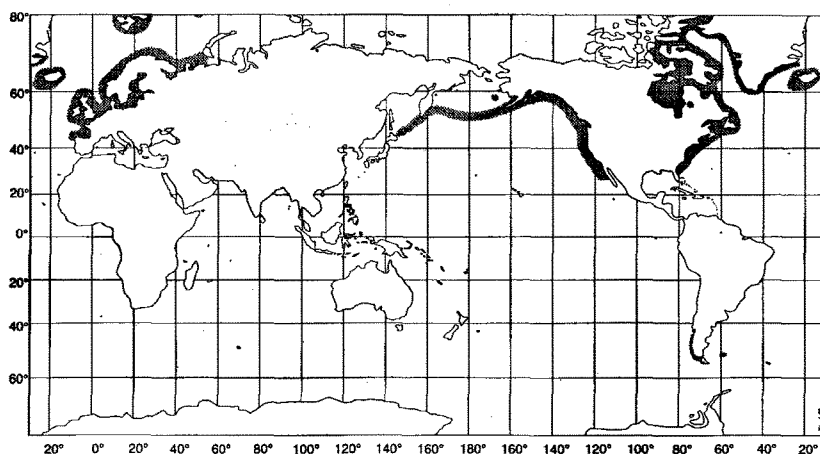


Fig. 522

**Biology and Behaviour:** On land, harbour seals are usually extremely wary and shy. It is almost impossible to approach them closely without frightening them into the water. They are gregarious at haul-out sites, where they frequently aggregate, especially at low tide. However, despite this aggregation behaviour, adults usually do not lie in close contact with each other. At sea, they are most often seen alone or in small groups.

The mating system is promiscuous or weakly polygynous. Mating usually takes place in the water, during the February to October breeding season. Pupping peaks sometime between April and July. In some regions, pupping occurs earlier in more southerly areas.

Harbour seals feed on a wide variety of fish, cephalopods, and crustaceans of surface, mid-water, and benthic habitats.

**Exploitation:** Harbour seals have been hunted for food since prehistoric times. They have been taken for pelts in small local enterprises and large commercial operations, and under quota and bounty systems as threats to the fishing industry. Most recently, an outbreak of a distemper virus claimed an estimated 18 000 seals in the European population. Also, due to the proximity of these seals to centres of human industrial dumping and agricultural runoff, many carry high burdens of toxic pollutants, whose effects on seal health and reproduction is undetermined. Small-scale subsistence harvesting, poaching, and incidental catch in fishing gear, particularly in gillnets, account for an unknown level of annual mortality.

**IUCN Status:** Insufficiently known; vulnerable (*P. v. stejnegeri* only).



***Phoca largha*** (Pallas, 1811)

PHOC Phoca 2

SST

**FAO Names:** En - Larga seal; Fr - Veau marin du Pacifique; Sp - Foca largha .

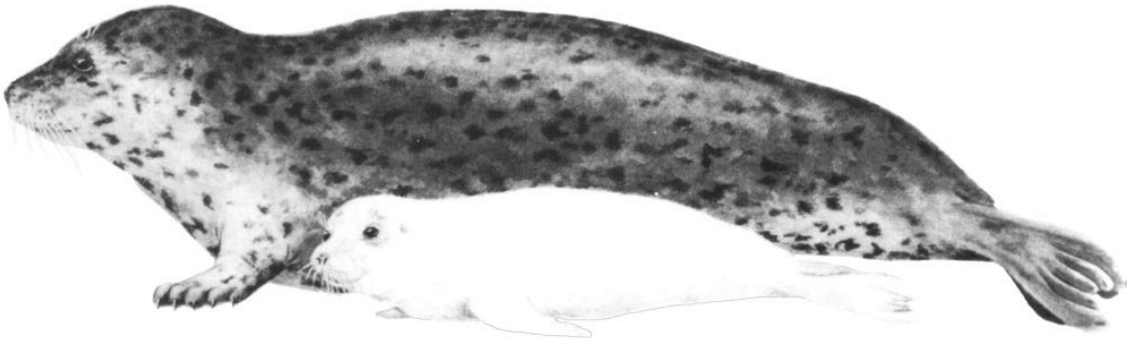
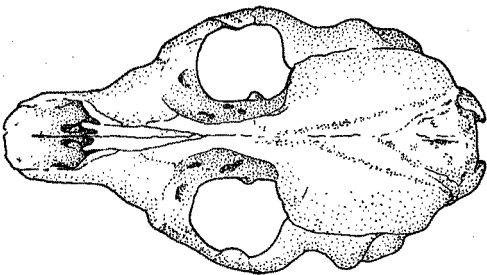


Fig. 523 *Phoca largha*

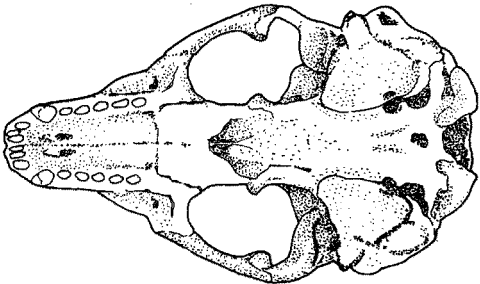
**Distinctive Characteristics:** Until recently, Larga seals were considered a subspecies of the harbour seal. Studies revealed morphological, biochemical, and behavioural differences sufficient to warrant its reclassification as a full species. Larga seals are smaller than harbour seals, but are nearly identical in build and proportions (see p. 258).

Coloration is generally pale, silver-grey above and below, with a darker mantle dominated by dark oval spots of fairly uniform size (1 to 2 cm) and generally oriented parallel to the long axis of the body. There may be light rings around some spots, or large irregular spots or blotches. Spotting tends to be of fairly even distribution and darkness overall. In harbour seals, spots are more faded and sparse on the underside. The face and muzzle are darker than in the harbour seal. Pups are born with a long, woolly, whitish lanugo, which is shed 2 to 4 weeks after birth.

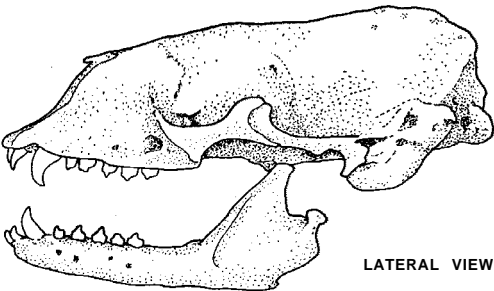
The dental formula of adults is  $I\ 3/2, C1/1, PC\ 5/5$ .



DORSAL VIEW



VENTRAL VIEW



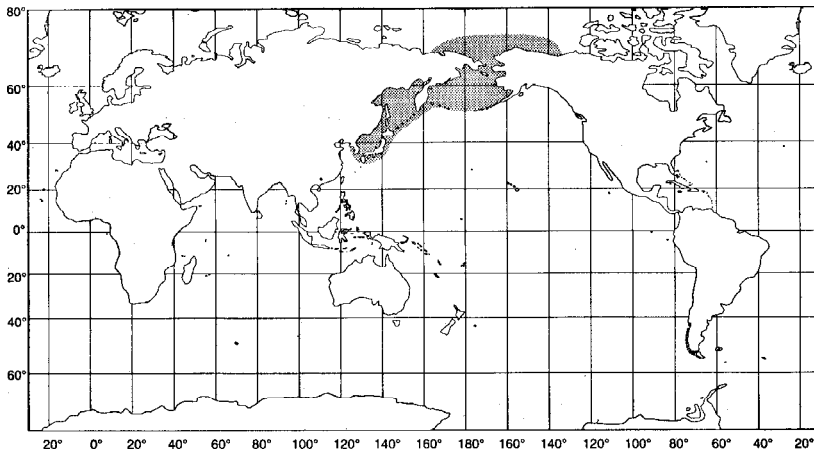
LATERAL VIEW

Fig. 524 Skull

**Can be confused with:** In addition to harbour seals (p. 258), 2 other phocids (ringed [p. 262] and ribbon [p. 270] seals) share the the Larga seal's range. Details of pelage markings and coloration, particularly the presence or absence of large numbers of rings (ringed seals), or conspicuous light and dark bands (ribbon seals) are sufficient to distinguish among them.. Further, ringed seals are generally solitary beside breathing holes, while Larga and ringed seals are most often found along fractures in larger floes. Of these species, only the ribbon seal moves on ice or land by slashing motion; the others inch along.

**Size:** Adult males are up to 1.7 m and females to 1.6 m long. Adults weigh 82 to 123 kg. At birth, Larga seals are 77 to 92 cm long and weigh 7 to 12 kg.

**Geographical Distribution:** Larga seals are widespread in the Sea of Okhotsk, and Yellow, Japan, and Bering seas. They inhabit the southern edges of the pack ice from winter to early summer and coastal areas, including river mouths, in late summer and autumn. They breed exclusively, and haul out regularly, on ice, but do come ashore on beaches and sand-bars.



**Fig. 525**

**Biology and Behaviour:** Larga seals are annually monogamous and territorial. Breeding takes place on pack ice from January to mid-April. Pupping peaks from mid to late March.

Adults can dive to at least 300 m, and they feed on a wide variety of organisms: composition of diet varies with the age of the seal. Newly weaned pups feed on small crustaceans, advance to schooling fishes, larger crustaceans, and octopuses, and finally graduate to bottom dwelling fish and cephalopods.

**Exploitation:** Small commercial and subsistence harvests of Larga seals have been active throughout this century, and continue to this day. An unknown number are incidentally caught in drift and gill net fishing operations every year.

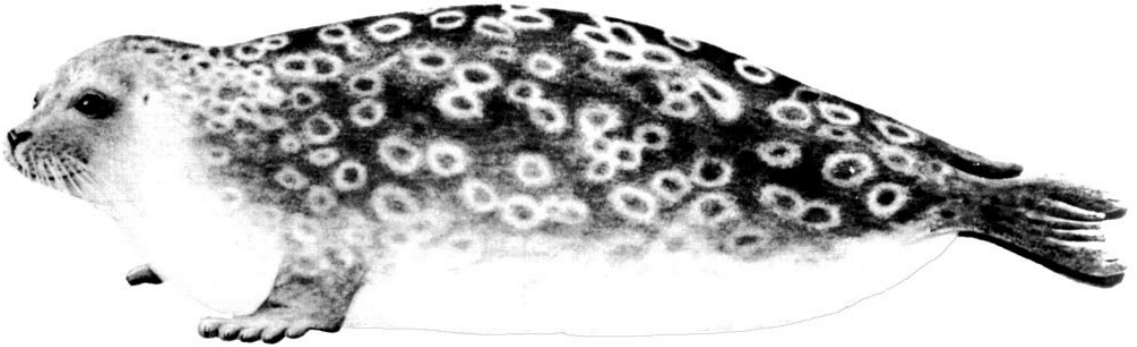
**IUCN Status:** Insufficiently known.

***Phoca hispida*** (Schreber, 1775)

PHOC Phoca 3

SER

**FAO Names:** En - Ringed seal; Fr - Phoque annelé ou marbré; Sp - Foca marbreads.

Fig. 526 *Phoca hispida*

**Distinctive Characteristics:** Ringed seals resemble harbour and Larga seals, but are decidedly plumper (axillary girth may reach 80% of length). They also have a smaller, somewhat rounded head, and a conspicuously short and thick neck. The muzzle is short, slightly broader than thick, and blunt. The vibrissae are light-coloured and beaded. The eyes are relatively large and conspicuous. More than in other northern phocids, the size of the head and muzzle and close-set, forward-facing, eyes impart a cat-like appearance. The foreflippers are relatively small and slightly pointed, as described for the harbour seal.

Coloration is the most distinctive feature. Ringed seals are conspicuously marked with spots that, especially on the back and sides, are circled with rings of lighter colour. The spots are the same colour as, or slightly darker than, the background colour of the coat. The rings are light grey to off-white. Seals can be so heavily marked that many spots and rings fuse. Despite individual and regional variation in both species, ringed seals are usually more profusely covered with ringed spots than are harbour seals. There are generally no, or very few, spots on the undersides, a feature that distinguishes ringed seals from both harbour and Larga seals. The background coloration is variable, but normally medium to dark grey above and light grey to silver below. Pups are born with a woolly thick whitish lanugo. Fur of the succeeding coat is finer and slightly longer than that of adults, and is dark grey above, merging to silver below. There may be a few scattered dark spots on the undersides of these juveniles, and few, if any, rings on the back. At this stage, they are known as "silver jars".

The dental formula is I 3/2, C 1/1, PC 5/5.

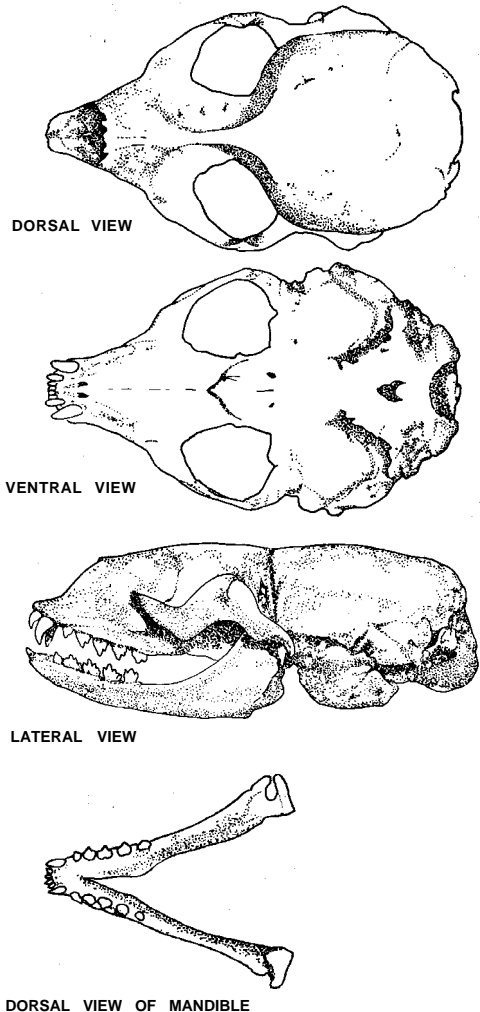


Fig. 527 Skull

**Can be confused with:** Ringed seals share their extensive range with 7 other phocids. They are not likely to be confused with bearded, harp, hooded, or ribbon seals, but care may be required to positively distinguish them from other seals with rings, spots or spot-like markings (harbour [p. 258], Larga [p. 260], juvenile harp [p. 268], and grey [p.272] seals). Differentiation requires attention to the size, coarseness, distribution (both above and below), and abundance of such markings. Also, note head and muzzle size, body length, and plumpness and length of the neck in relation to the body length.

**Size:** Adults are up to about 1.65 m in length. Weight is 50 to 110 kg. Pups average about 60 to 65 cm and 4 to 5 kg at birth.

**Geographical Distribution:** Ringed seals have a circumpolar distribution throughout the Arctic basin, Hudson Bay and Strait, and the Bering and Baltic seas. There are 5 recognized subspecies: *P. h. hispida*, in the Arctic basin; *P. h. ochotensis*, in the Seas of Okhotsk and Japan; *P. h. saimensis*, in Lake Saimaa; *P. h. lagodensis*, in Lake Ladoga; and *P. h. botnica*, in the Baltic Sea. The distribution of ringed seals is strongly correlated with pack and land-fast ice, and areas covered at least seasonally by ice.

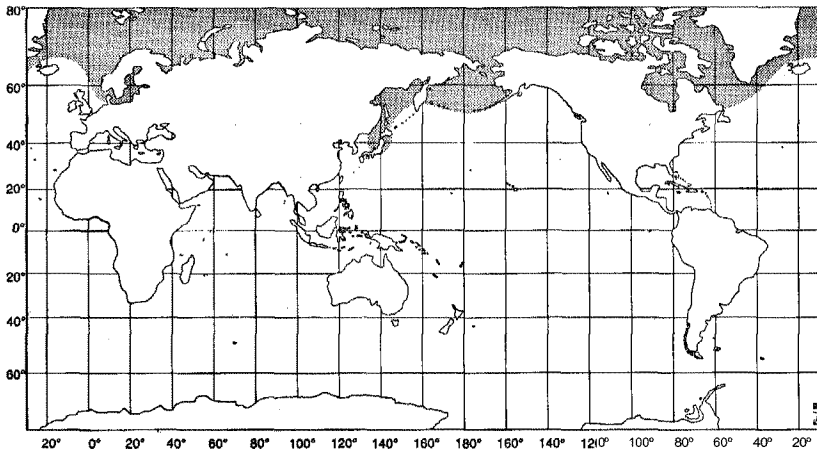


Fig. 528

**Biology and Behaviour:** Nearly all ringed seals breed on the fast ice, where females excavate lairs in pressure ridges and other snow-covered features. These allow access to the water, but are hidden from polar bears. Pupping generally occurs in March-April, earlier in the Baltic Sea. Males are thought to be territorial, and possibly annually monogamous.

Many adults remain in the same localized areas year-round. Out of water, ringed seals are generally wary, regularly scanning for predators, such as polar bears and humans.

Ringed seals consume a wide variety of small prey, including many species of fishes and planktonic crustaceans, taken throughout the water column. They forage either singly or in small groups.

**Exploitation:** Ringed seals have been a mainstay in the diet of native Arctic peoples. The seals are consumed by people and fed to sled dogs, and their skins are used for clothing. Subsistence hunting continues today, and accounts for an unknown, but probably significant number of seals every year. Commercial sealing primarily for pelts has been wide-spread. Pollution in some localities, such as the Baltic Sea, is of great concern and may be the reason for local population declines. The status of the current worldwide population is variable, depending on location, with numbers in some areas increasing and decreasing in others.

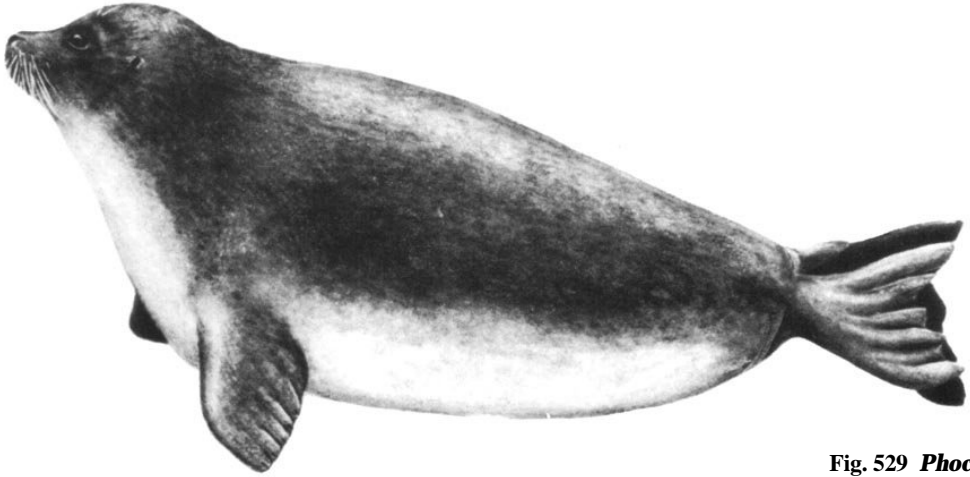
**IUCN Status:** Insufficiently known; endangered (*P. h. saimensis* only); vulnerable (*P. h. botnica* and *P. h. lagodensis* only).

***Phoca sibirica*** (Gmelin, 1788)

PHOC Phoca 4

SBK

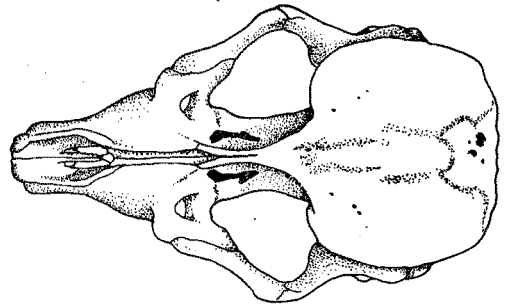
FAO Names: En - Baikal seal; Fr - Phoque du lac Baikal; Sp - Foca de Baikal.

Fig. 529 *Phoca sibirica*

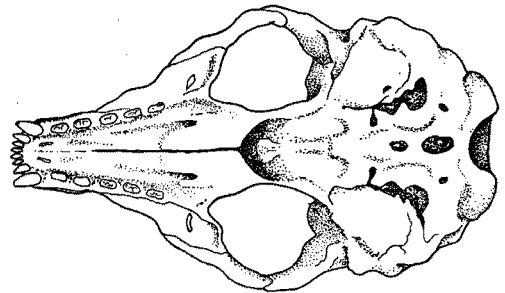
**Distinctive Characteristics:** The Baikal seal is essentially a population of ringed seals that evolved in reproductive isolation. Baikal seals are very similar to ringed seals (p. 262), except for a few aspects of their flippers and coloration. Their foreflippers and claws are decidedly larger and stronger than those of ringed or Caspian (p. 266) seals.

Baikal seals have very few, if any, of the characteristic rings found on ringed seals and are normally darker above and below than either ringed or Caspian seals. Baikal seal pups are born in a whitish lanugo that is shed at 4 to 6 weeks.

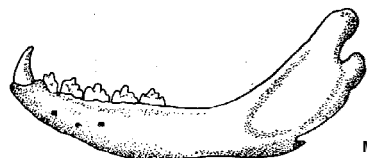
The dental formula is I 3/2, C 1/1, PC 5/5



DORSAL VIEW



VENTRAL VIEW



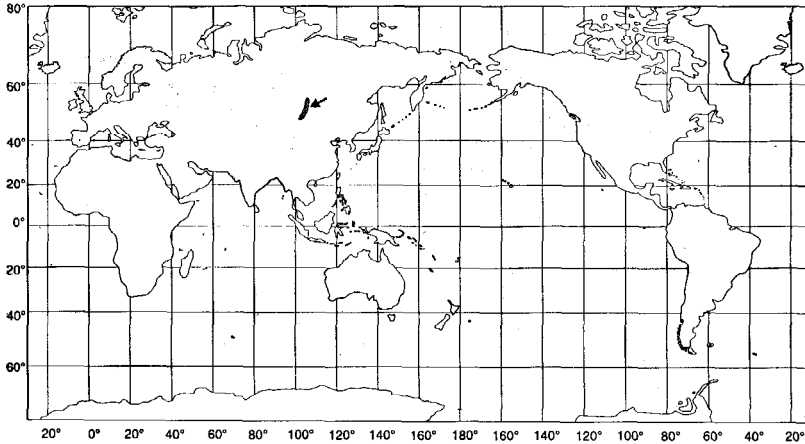
MANDIBLE

Fig. 530 Skull

**Can be confused with:** There should be no confusion: the Baikal seal does not share its range with any other pinniped species.

**Size:** Measurements of Baikal seals have been taken as curvilinear lengths, which yield longer measurements than the standard lengths used for other species. Adult Baikal seals have been reported to reach approximately 1.4 m and 80 to 90 kg. Newborn pups are 64 to 66 cm in length and 4 to 4.2 kg in weight.

**Geographical Distribution:** Baikal seals are entirely confined to Lake Baikal and its feeder streams in eastern Russia.



**Fig. 531**

**Biology and Behaviour:** Baikal seals are similar to ringed seals in most respects. They maintain breathing and access holes in ice (the number varying by age and sex, to 11 in adult males) and use snow-covered lairs on the lake ice. Some seals share haul-out holes, but most animals are solitary. Pupping occurs from mid-February to the end of March. Newly weaned pups emerge from the lairs in April.

Baikal seals experimentally equipped with tracking instruments generally dived for 10 to 20 minutes, to depths of 50 to 200 m; the deepest dives were to 300 m. Their diet consists primarily of many varieties of freshwater fishes.

**Exploitation:** Baikal seals have been hunted since prehistoric times, and there has been a long history of commercial exploitation that continues to the present for meat and skins, with carcass remains going to feed domestic animals. There are government quotas, but poaching is common. Seals hauled out are frequently disturbed by human activities, and there was a recent outbreak of a virus causing symptoms like canine distemper.

**IUCN Status:** Insufficiently known.

***Phoca caspica*** (Gmelin, 1788)

PHOC Phoca 5

SAC

FAO Names: En - Caspian seal; Fr - Phoque de la Mer Caspienne; Sp - Foca del Caspio .

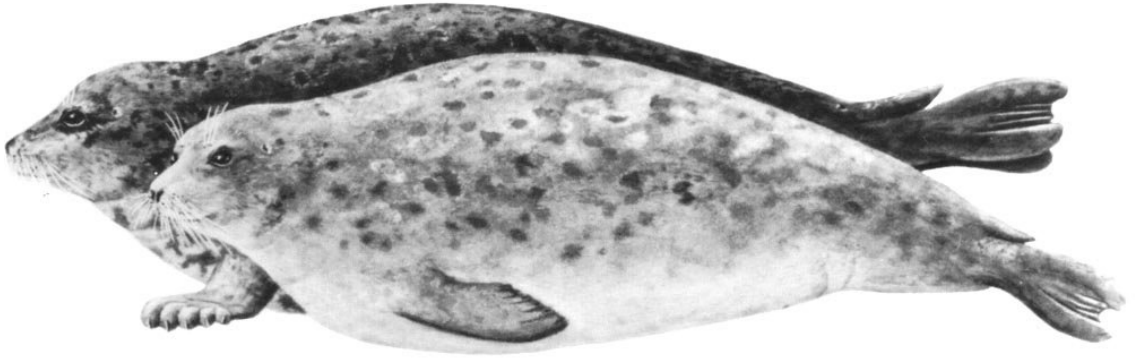
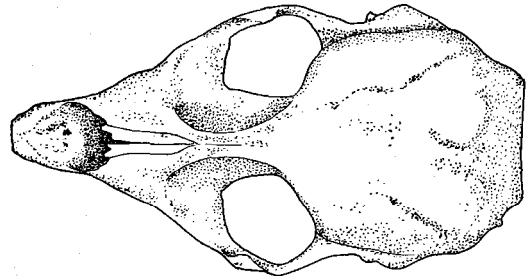


Fig. 532 *Phoca caspica*

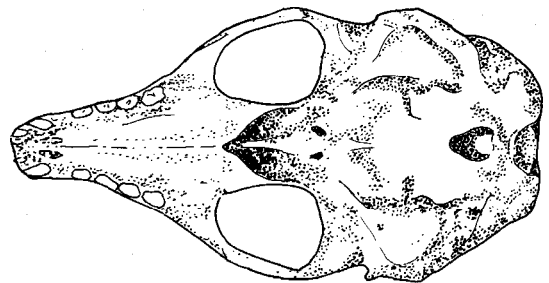
**Distinctive Characteristics:** The Caspian seal, like the Baikal seal, is essentially a population of the ringed seal (p. 262) that has evolved in isolation. The chief differences between Caspian seals and ringed seals are in pelage colour and markings.

Caspian seals are greyish yellow to dark grey above, grading to a paler shade below. There are numerous brown to black spots on the back in both sexes. However, these spots are darker and more abundant on the male. There are often no rings; when they do occur, they are much sparser than on ringed seals. The pup's whitish lanugo is moulted at about 3 weeks for a short dark pelage.

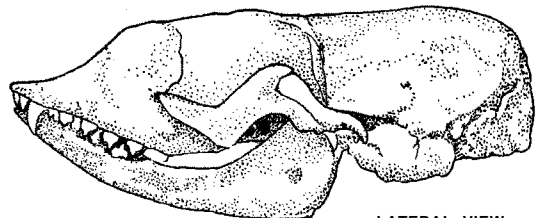
The dental formula is I 3/2, R 1/1, PC 6/5.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW  
WITH MANDIBLE

Fig. 533 Skull

**Can be confused with:** No other pinniped occurs in the Caspian Sea region, and this species occurs nowhere else in the world.

**Size:** Adult males and females reach maximum lengths of 1.5 and 1.4 m, respectively, and weigh around 86 kg. Pups are 64 to 79 cm and about 5 kg at birth.

**Geographical Distribution:** Caspian seals are entirely confined to the saline waters of the Caspian Sea and its feeder rivers, which are bordered by several of the states of the new Russian Commonwealth and Iran. Seasonal movements in the Caspian Sea are prompted by ice formation. Seals occupy the north-eastern quadrant in autumn, but in spring and summer they move south into the deeper and cooler regions of the Caspian Sea.

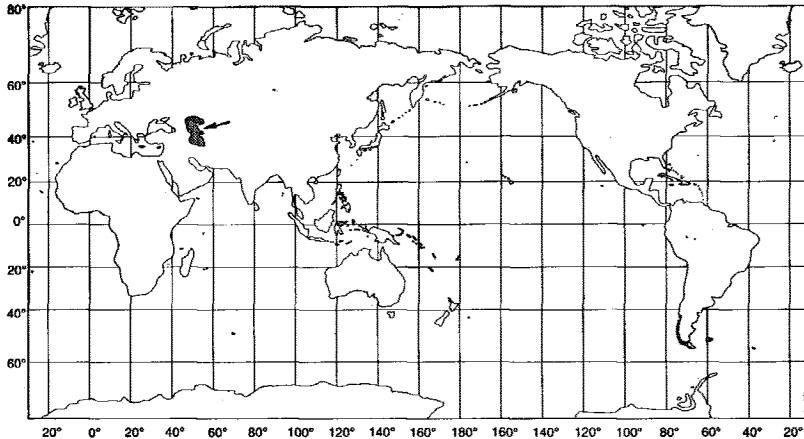


Fig. 534

**Biology and Behaviour:** The pupping season lasts from late January to early February. Unlike the ringed seal or Baikal seal, Caspian seal pups are born out on the open ice. Mating occurs from late February to mid-March. There is little information on behaviour of this little-known seal.

Caspian seals take a variety of fishes and small crustaceans; the diet varies seasonally.

**Exploitation:** Caspian seals have undoubtedly been hunted since prehistoric times. A large scale commercial harvest since the 19th Century continues to this day under government regulated quotas.

**IUCN Status:** Vulnerable.



***Phoca groenlandica*** (Erxleben, 1777)

PHOC Phoca 6

SEH

FAO Names: En - Harp seal; Fr - Phoque du Groenland; Sp - Foca de Groenlandia.

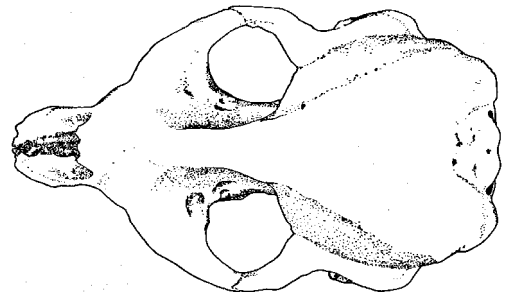
Fig. 535 *Phoca groenlandica*

**Distinctive Characteristics:** The harp seal's head appears somewhat long, wide, and flattened. The long muzzle tapers slightly, and in adults, can appear upturned. The eyes are close-set and there is a slight dip to the forehead. The flippers are relatively small. The foreflippers are slightly pointed and angular, with a short row of digit endings. The claws are strong and dark.

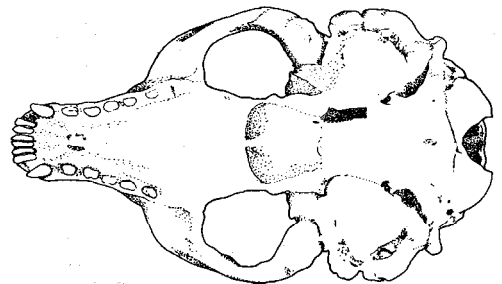
The ontogeny of pelage patterns (reflected in the names of the various age classes) is the species' most distinctive feature. The newborn's pure white coat (which can be stained yellowish for the first few days by amniotic fluid) persists for about 12 days (thus the name "whitecoats"), then it develops a greyish coat ("greycoats"). At about 21 days, the hair begins to fall out in patches ("ragged-jackets"), giving way to a medium grey subadult coat that is scattered with black blotches ("beaters"). At 13 to 14 months of age, "beaters" moult again: the pelage remains the same ("bedlamers") until the adult pattern begins to appear at the onset of sexual maturity (earlier in males than in females).

The adult pattern is complex and varied. The base colour is silvery white. Two black bands of variable width, joined over the shoulders, extend posteriorly as crescents and sweep down the sides to the area of the pelvis, forming the "harp." Seen from above, the pattern resembles a large irregular "V." Black marks may also occur at the insertions of the hind-flippers. The head is hooded in black, with a ragged edge on the neck and throat. Many adults retain from a few to many spots; and have incompletely formed harp patterns on their backs ("spotted harps"). A small percentage of seals never develop the harp, retain spots, may have some dark streaks, and are dark grey overall ("sooty harps").

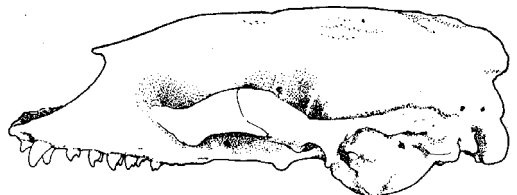
The dental formula is I 3/2, C 1/1, PC 5/5.



DORSAL VIEW



VENTRAL VIEW



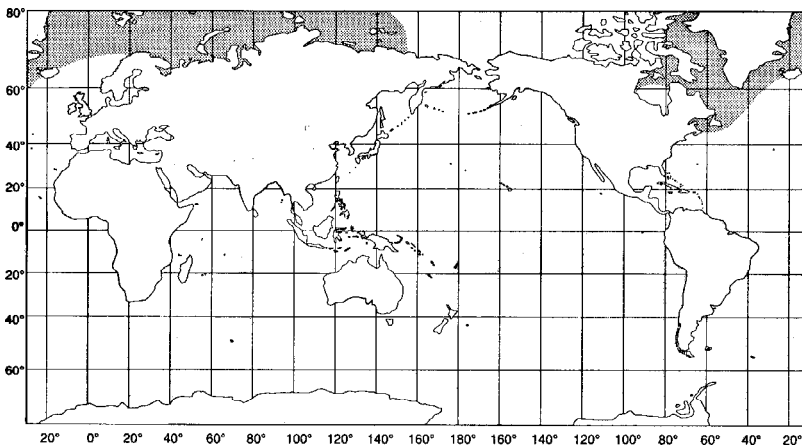
LATERAL VIEW

Fig. 536 Skull

**Can be confused with:** Harp seals in adult pelage are unlikely to be confused with any other animal. The silvery white body, emblazoned with a conspicuous black harp pattern and hood, is unique. However, the 'bedlamer' and 'spotted harp' patterns are more generic, and pose some difficulties. To distinguish harp seals from the 5 other phocids that share their range (harbour [p. 258], ringed [p. 262], gray [p. 272], bearded [p. 274], and hooded [p. 276] seals), note overall body size; size and shape of the head, muzzle, and nose; details of pelage markings (e.g., spots, rings, or blotches); and base colour (uniform or contrasting from top to bottom).

**Size:** Adult males are up to 1.9 m in length and average 135 kg in weight, females up to 1.8 m and 120 kg. Pups are born at about 85 cm and almost 10 kg.

**Geographical Distribution:** Harp seals are widespread in the the Arctic and North Atlantic oceans and adjacent areas from Hudson Bay and Baffin Island east to Cape Chelyuskin, in northern Russia. The most famous of the 3 population centres is the "Front," near the Magdalen Islands and waters off northeastern Newfoundland and southern Labrador. Harp seals live chiefly in pack ice, but can be found away from it in summer.



**Fig. 537**

**Biology and Behaviour :** Harp seals congregate to whelp (pup) on pack ice, where they form huge concentrations. Pups are born from late February to mid-March. Mating occurs in the water from mid to late March.

Harp seals are migratory, breeding at the southern edge of the pack ice in late winter, moulting nearby in spring, and following the ice north in summer to the high Arctic. They are very active in the water and sometimes travel in tight groups that are quite large and noisy.

Harp seals feed on a variety of crustaceans and open-water fishes during migration, and switch to several varieties of bottom dwelling fishes in summer on the northern grounds.

**Exploitation:** Harp seals have been hunted since the earliest times by people inhabiting arctic and subarctic areas. They have been the object of commercial harvesting, principally on the whelping grounds, for fur and oil, dating back to the late 18th Century. In particular, harp seal pups have been clubbed in large numbers for their white coats. This controversial industry continues today on a greatly reduced scale under international quotas.

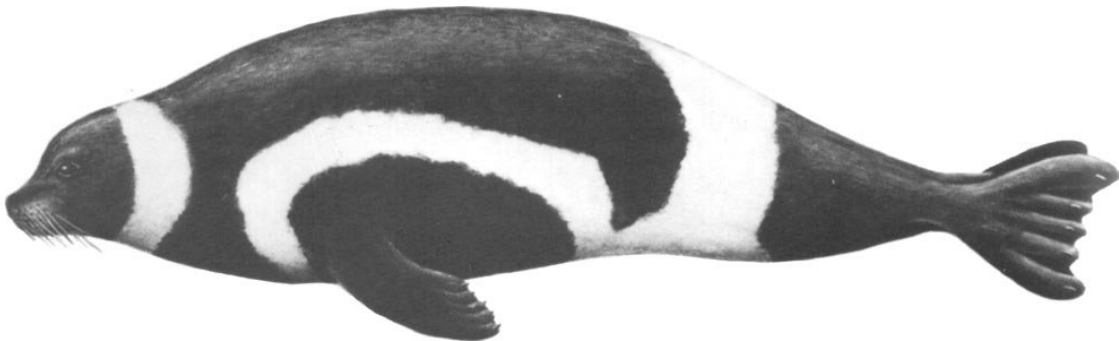
**IUCN Status:** Insufficiently known.

***Phoca fasciata*** (Zimmerman, 1783)

PHOC Phoca 7

SLR

FAO Names: En - Ribbon seal; Fr - Phoque à rubans; Sp - Foca fajada.

Fig. 538 *Phoca fasciata*

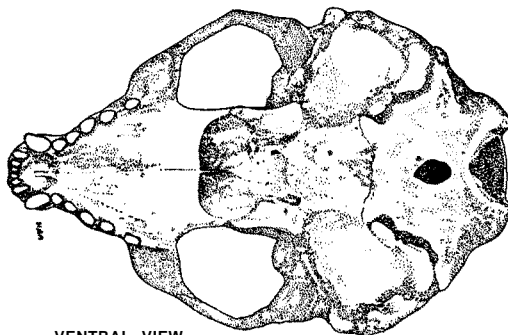
**Distinctive Characteristics:** Ribbon seals are more slender than other Bering Sea ice seals. The head is small, relatively wide, flat, and somewhat cat-like. The forehead is small in profile. The close-set eyes appear large, and the muzzle is short, blunt, and tapers slightly. The nostrils are also small and terminal, forming a V-pattern that converges at the bottom. The vibrissae are light-coloured, beaded, and fairly prominent. There are long, thin, hooked claws on all digits of the foreflippers. The ends of the foreflippers are weakly pointed to somewhat squared off, with only slightly different digit lengths.

Ribbon seals have an exceptionally striking colour pattern. Newborns have a shaggy, woolly, whitish lanugo that is shed at about 5 weeks. Youngsters are fairly plain-looking, without a hint of the bold pattern of adults. Subadults are blue-black above, including the crown and tops of the foreflippers, fading to silver-grey on the flanks and undersides. The face is pale and the end of the muzzle, lower jaw, and chin are dark. In adults of both sexes, pale bands of variable width encircle each foreflipper and shoulder, the neck, and the lower back, flank, and abdomen. The bands vary greatly in width (on some animals they are so wide that they merge). Band colour ranges from a shade just paler than the surrounding dark pelage to off-white. The freshly moulted base colour in adult males is reddish brown to black. Adult females are much paler, tan to light brown, rendering the bands less distinct.

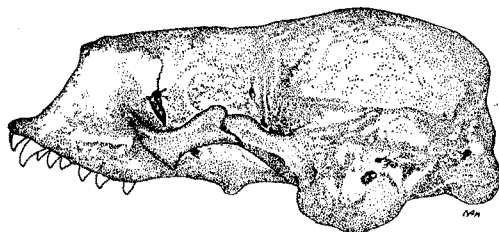
The dental formula is I 3/2, C 1/1, PC 5/5.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 539 Skull

**Can be confused with:** Four other phocids: ringed (p. 262), harbour (p. 258), Larga (p. 260), and bearded (p. 274) seals share the range of the ribbon seal. Look for details of pelage markings and coloration, particularly the presence of markings (other than 4 obvious wide pale bands) such as spots, blotches, or large numbers of rings. Also, note overall size, relative size of the head and muzzle, and girth-to-length ratio.

**Size:** Adult ribbon seals reach a maximum length of about 1.8 m and weights of 90 to 148 kg. Pups are approximately 86 cm long and 10.5 kg at birth.

**Geographical Distribution:** Ribbon seal distribution closely matches that of Larga seals. The former are widespread in the seas adjacent to the western and central North Pacific Ocean. They occur in the Sea of Okhotsk and Sea of Japan, and from the Bering Sea northward to the western Beaufort and eastern Chukchi seas. Ribbon seals inhabit the southern edge of the pack ice from winter to early summer. Most are thought to be pelagic in the Bering Sea during the summer.

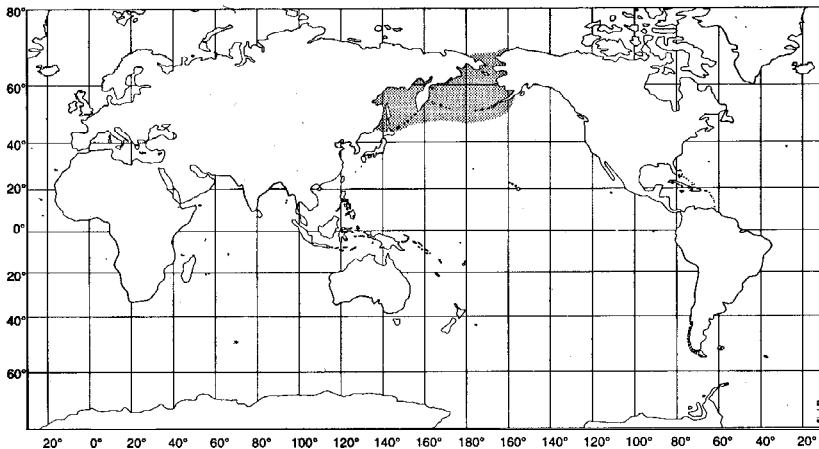


Fig. 540

**Biology and Behaviour:** Ribbon seals are solitary for much of their lives. Pups are born on ice floes from early April to early May. Males are generally nowhere to be seen during the nursing period. Ribbon seals are able to move rapidly on ice, using slashing side-to-side motions. They also extend their necks to peer at sources of disturbance, but are fairly approachable by boat. They are rarely encountered, because of the remote and inhospitable nature of their polar habitat.

Little is known of the diet of ribbon seals, except that types of prey vary by area, and probably season. Several species of fishes and crustaceans are consumed.

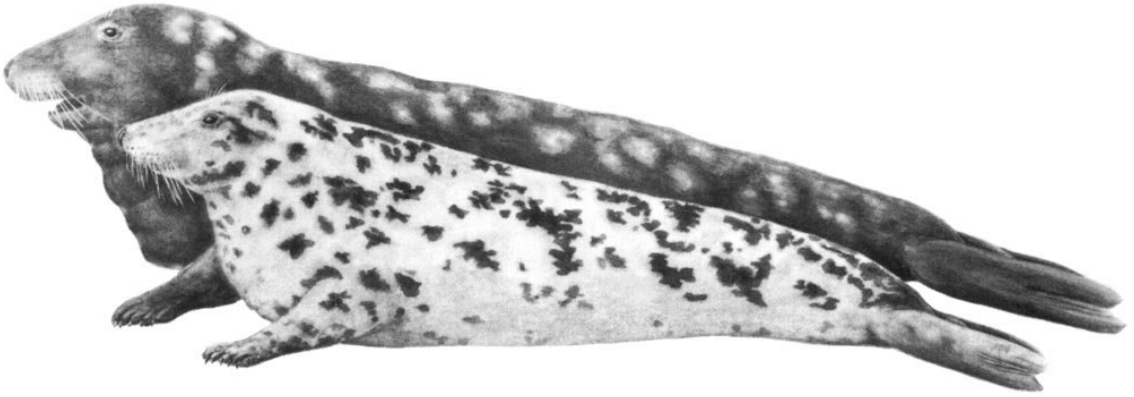
**Exploitation:** Only very small numbers of ribbon seals have ever been taken in commercial or subsistence harvests, the latter carried out by native peoples since prehistoric times.

**IUCN Status:** Insufficiently known.

***Halichoerus grypus*** (Fabricius, 1791)

PHOC Hali 1

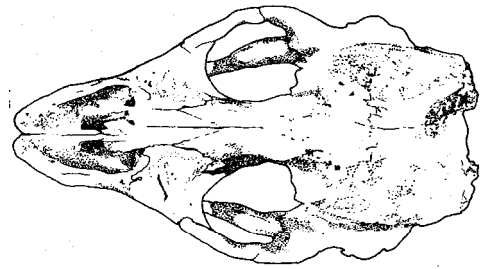
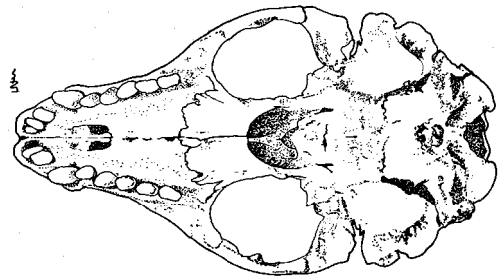
SEG

FAO Names: **En** - Grey seal; **Fr** - Phoque gris; **Sp** - Foca de gris.Fig. 541 *Halichoerus grypus*

**Distinctive Characteristics:** Grey seals are robust and sexually dimorphic; males grow noticeably larger, with a proportionately larger and broader head. The distinctive muzzle is particularly long, and wide at the end, with a fleshy mystacial area that somewhat obscures the lower jaw. In adult males, the top of the muzzle is convex. In adult females and subadults, it is flat, very slightly convex (as in adult males), or slightly concave; the latter having only a barely noticeable forehead. The shape of the head has led to the locally used common name "horsehead." The nostrils are widely separated and almost parallel to each other, forming almost a W-pattern as opposed to the V-shaped pattern of seals of the genus *Phoca*. The eyes are small in proportion to the size of the head and somewhat widely separated. The foreflippers are short, on adult males, and are wide and relatively thick. Typically, adult males are somewhat thicker through the neck than females.

Pelage colour and pattern are individually variable. Most grey seals are shades of grey, slightly darker above than below. There are usually numerous irregular blotches and spots on the back and sometimes a few below. Many males darken with age. Subadults are paler, with few, if any, blotches; some are light tan just prior to moult. Others are orange to reddish on the neck, underside, and flippers. Newborns have a silky, creamy white lanugo, occasionally with a greyish tinge. In 2 to 4 weeks, this coat is replaced by one like that of the female, but with more subtle markings.

The dental formula of adults is  $I\ 3/2, C1/1, PC\ 5-6/5$ .

DORSAL VIEW  
WITH MANDIBLE

VENTRAL VIEW

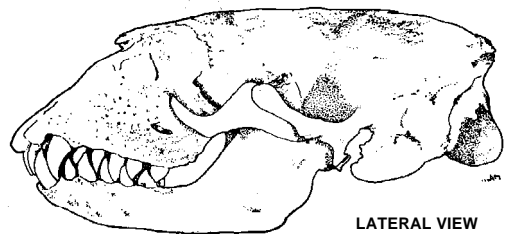
LATERAL VIEW  
WITH MANDIBLE

Fig. 542 Skull

**Can be confused with:** Five phocids share the grey seal's range. The grey seal is larger, with a relatively larger head and longer muzzle, and a decidedly different set of pelage markings than harbour (p. 258), harp (p. 268), and ringed (p. 262) seals. The characteristics of the head, muzzle, and nose, and overall colour and markings will help separate grey seals from the comparably sized bearded (p. 274) and hooded (p. 276) seals.

**Size:** Adult males are up to 2.3 m long and weigh 170 to 310 kg, females to 2 m and 105 to 186 kg. Pups are 90 to 105 cm and 11 to 20 kg at birth.

**Geographical Distribution:** Grey seals have a cold temperate to subarctic distribution in the North Atlantic. There are 3 somewhat isolated stocks: a western Atlantic stock centred in northeastern North America; an eastern Atlantic stock split between Iceland, the Faeroe Islands, Norway, the United Kingdom, and Ireland; and a Baltic Sea stock. Grey seals are generally coastal; they haul-out on isolated beaches and rocky ledges of islands. In some localities, they move well inland to pup and breed.

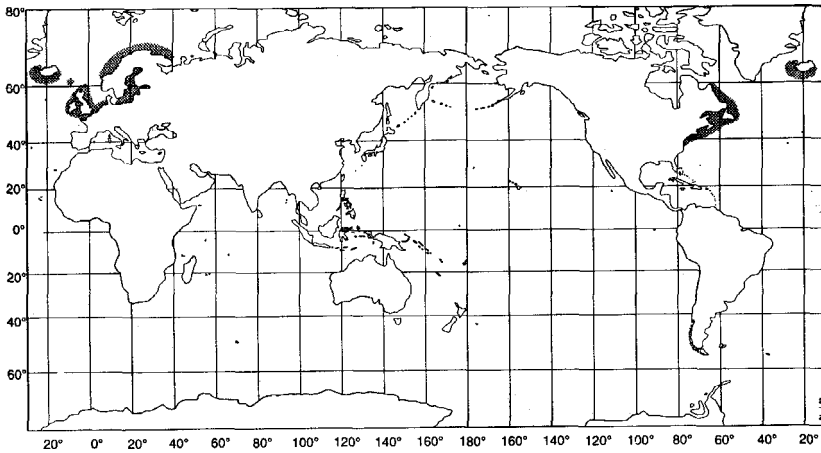


Fig. 543

**Biology and Behaviour:** Grey seals are polygynous. Males actively compete for females, but actually fight little, relying instead on threat gestures and vocalizations. They do not defend territories or herd females. Pupping and breeding occur between late September and early March. Seals in the British Isles breed earliest, followed by those in Norway and Iceland, and finally those off Canada and in the Baltic Sea.

Grey seals disperse widely from their rookeries during the non-breeding season, but reassemble to moult. When ashore, they are generally gregarious, hauling out near each other, as well as with harbour seals. In the water they are usually solitary, or in small dispersed groups. They regularly maintain a vertical "bottle" position, treading water with only the head exposed.

Grey seals feed in inshore benthic habitats, on a wide variety of fishes and invertebrates. They also feed on schooling fish in the water column, and occasionally take seabirds.

**Exploitation:** Grey seals have been the target of subsistence hunting, followed by commercial hunting and, finally, government-sponsored culls to control their numbers as pests to fisheries.

**IUCN Status:** Insufficiently known.

***Erignathus barbatus*** (Erxleben, 1777)

PHOC Eri 1

SEB

FAO Names: En - Bearded seal; Fr - Phoqué barbu; Sp - Foca barbuda.

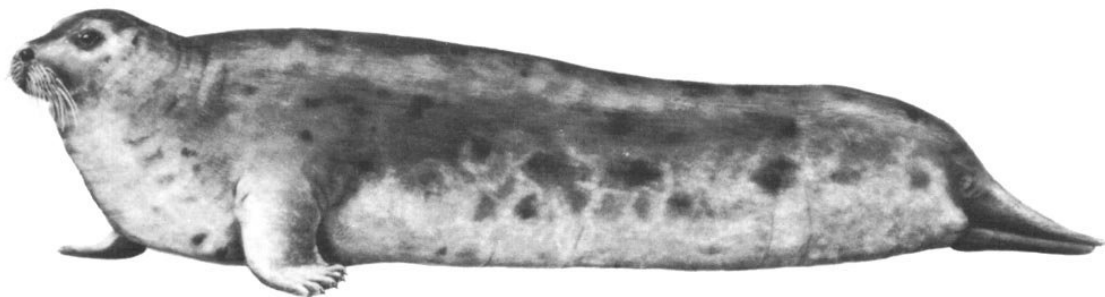


Fig. 544 *Erignathus barbatus*

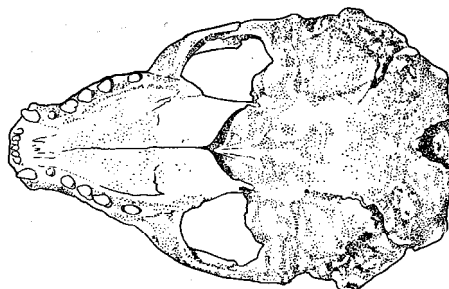
**Distinctive Characteristics:** Bearded seals are large, but look even longer because of their small head and relatively short foreflippers. The head is rounded and somewhat narrow, and the eyes are relatively small and close-set. The muzzle is wide and fleshy, with widely spaced nostrils. The abundant vibrissae are pale, not beaded as in other Arctic phocids, and are long and densely packed. When wet they are straight, but when dry they curl inwards at the tips. The whiskers are sufficiently conspicuous to have given rise to the common name, "bearded" seal. The foreflippers are short, relatively broad, and strong, with robust claws. Unlike any other phocid, the bearded seal's foreflippers end in digits of about the same length, though the middle digits may be slightly longer on some individuals. This creates a square, or slightly rounded, end to the flippers. Unlike all other Arctic phocids, bearded seals have 4 retractable teats, instead of 2.

Adults are slightly darker above than below. Body coloration varies considerably from light or dark grey to brown: the face and flippers are often rust-coloured. Pups have a long, dark, wavy coat, with up to 4 transverse bands of lighter colour from the back to the crown of the head. The muzzle and the area around the eyes are pale. Sometimes a dark line, originating at the crown, extends between the eyes.

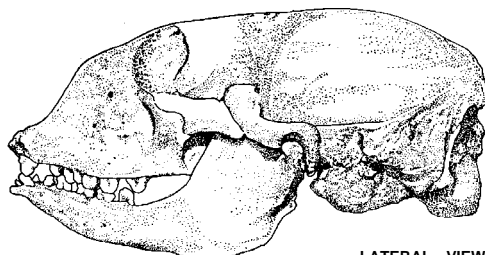
The dental formula is I 3/2, C 1/1, PC 5/5.



DORSAL VIEW



VENTRAL VIEW



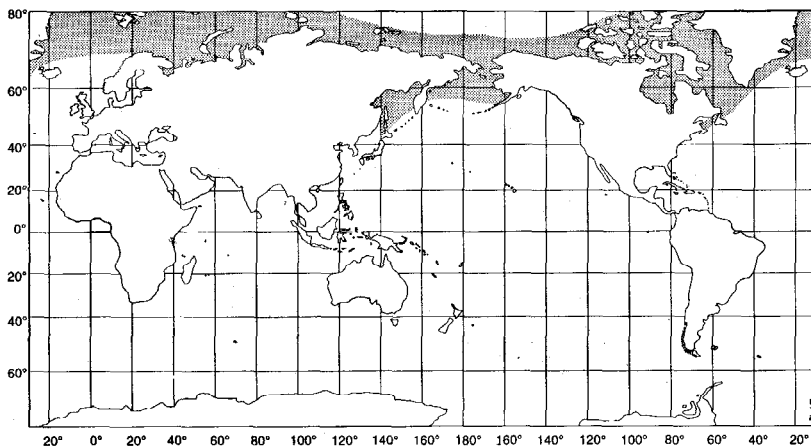
LATERAL VIEW  
WITH MANDIBLE

Fig. 545 Skull

**Can be confused with:** Bearded seals share their range with 7 other phocids: harbour, Larga, ringed, ribbon, harp, hooded, and grey seals. Of these, most are smaller, spotted (or otherwise uniquely coloured), or generally distributed further south. In the North Atlantic, the bearded seal is most likely to be mistaken for the hooded seal (p. 276) on shore, and additionally the harp seal (p. 268) in the water. These latter species have distinctively marked colour patterns, not likely to be confused with the more-or-less uniform pattern of bearded seals.

**Size:** Adults range up to 2.5 m in length. Adult females are slightly longer than males. In the Bering Sea, males reach 262 kg and females 361 kg. Pups are, on average, about 1.31 m and 33.6 kg at birth.

**Geographical Distribution:** Bearded seals have a circumpolar distribution in the Arctic, generally south of 80°N. They are subarctic in some areas, such as the lower Bering Sea, Sea of Okhotsk, and western North Atlantic where they reach the Gulf of Saint Lawrence. They usually restrict themselves to sea ice and stay in relatively shallow areas of continuously moving ice, where open leads and polynyas regularly form. In some areas, they are known to haul out on shore, ascend streams, or live a pelagic existence away from ice and land for long periods of time.



**Fig. 546**

**Biology and Behaviour:** Pups are born in the open on pack ice, from mid-March to early May. After the breeding season, many seals migrate northward with the retreating ice, returning southward again as the ice advances in autumn and winter.

Bearded seals are solitary. Seals rarely haul out on the same ice floe with other seals, and even then, maintain healthy distances from neighbors. At times, however, currents cause ice pile-ups in small areas, forcing aggregation of seals. Bearded seals are exceptionally wary and always haul out with their head very close to the water at an ice edge or breathing hole.

In the water, bearded seals are often found "bottling" vertically, asleep. When startled, they swim with strong strokes of the foreflippers. Foreflippers are probably also important in social interactions.

Bearded seals feed on many species of small invertebrates that live on, and in, the bottom. It is likely that they supplement their diet with fishes, as well.

**Exploitation:** Bearded seals have been, and continue to be, hunted by humans. Subsistence hunting goes back to prehistoric times, and they are still a mainstay of many local villages in the far north. They are a source of food, but also provide valuable hides for clothing and covering boats. Small-scale commercial harvesting is engaged in by the Russians to this day.

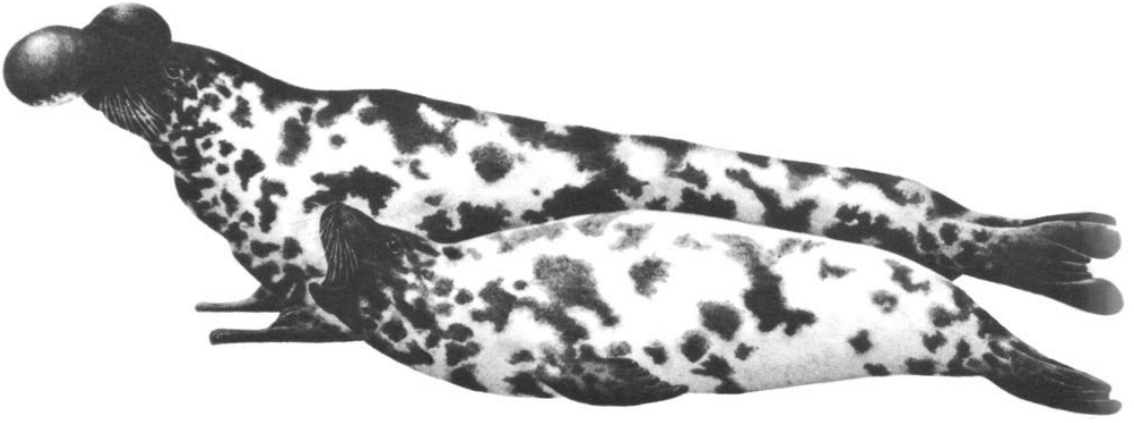
**IUCN Status:** Insufficiently known.



***Cystophora cristata*** (Erxleben, 1777)

PHOC Cysto 1

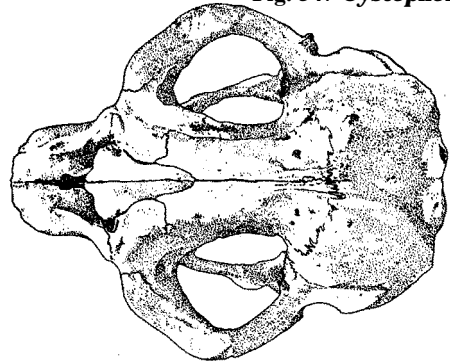
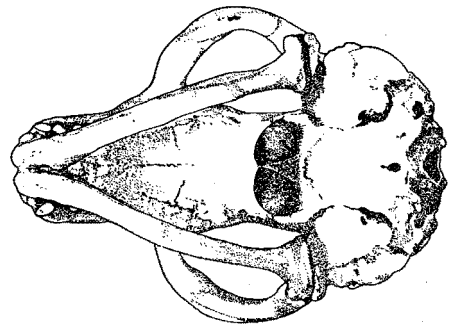
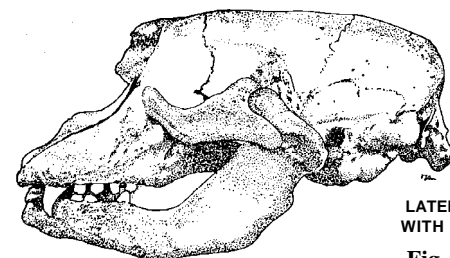
SEZ

**FAO Names:** En - Hooded seal; Fr - Phoque à crête; Sp - Foca capuchina.**Fig. 547 *Cystophora cristata***

**Distinctive Characteristics:** Hooded seals are sexually dimorphic. Both sexes are robust, with large, wide, and relatively short heads. The muzzle is very wide and fleshy; it overhangs the mouth and droops slightly in adult females and subadults. In adult males, however, there is an inflatable nasal cavity in the form of a black bladder. When flaccid, it hangs down in front of the mouth; when inflated, it forms a taut, crescent shaped hood that almost doubles the size of the head and substantially elevates the profile. Male hooded seals also can close the right nostril, extruding a membrane from the left nostril as a brownish to bright red balloon-like structure. The flippers are relatively short, and are slightly pointed and angular with a longer first digit. The vibrissae are beaded, relatively short, and inconspicuous; they are dark in pups and light in adults.

Adults are silvery grey, with scattered, irregularly sized, dark blotches. These blotches coalesce on the head and muzzle. The foreflippers are generally dark. Pups are called "bluebacks," born in a handsome coat of dark blue-grey above and creamy white below. The dark colour continues onto the hindflippers and also extends downward to include the foreflippers. The pale colour rises high on the flanks and neck, and encompasses the lower jaw. Bluebacks retain their coat until the following summer. The face and muzzle are very dark, almost black, to behind the eyes.

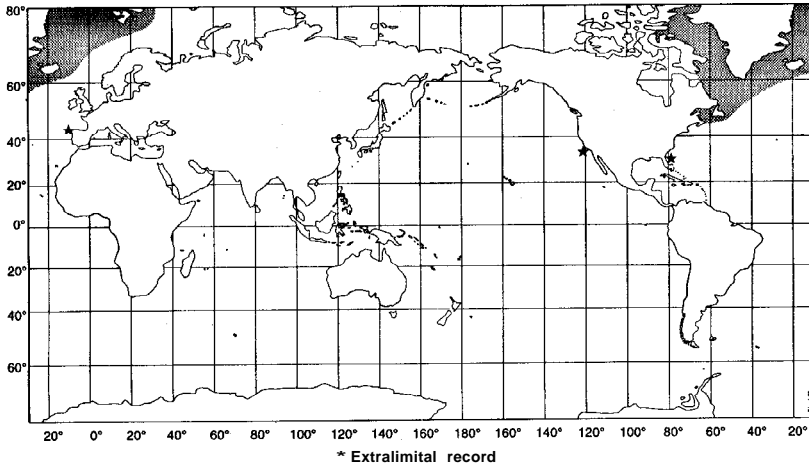
The dental formula is I 2/1, C 1/1, PC 5/5.

**DORSAL VIEW WITH MANDIBLE****VENTRAL VIEW WITH MANDIBLE****LATERAL VIEW  
WITH MANDIBLE****Fig. 548 Skull**

**Can be confused with:** Hooded seals share their range with 5 other phocids. Harp (p. 268), harbour (p. 258) ringed (p. 262), bearded (p. 274), and grey (p. 272) seals can be distinguished by pelage colour, and head shape and size. Hooded seals are most likely to be confused on ice with bearded seals, and additionally in the water, with harp seals. Harp seals are small and uniquely marked. Bearded seals are larger with a small head and "bearded" look.

**Size:** Adult males reach lengths of 2.6 m and weights of 300 to 400 kg; females average about 2 m in length and weigh 145 to 300 kg. Pups are born at 87 to 115 cm and weigh 20 to 30 kg.

**Geographical Distribution:** Hooded seals are found in the Atlantic region of the Arctic Ocean, and in high latitudes of the North Atlantic. They breed on pack ice and are associated with it for most of their lives, shifting their distribution with its seasonal fluctuations. There are 4 major whelping areas. Hooded seals wander widely, and have been found as far south as Florida and Portugal. Astoundingly, 1 female recently made her way to San Diego, California, on the opposite side of the continent from the species' normal range.



**Fig. 549**

**Biology and Behaviour:** Hooded seals pup away from floe edges, on pack ice in March and early April. Females are usually widely separated and aggressively defend their pups. Remarkably, pups are weaned in an average of only 4 days, the shortest time for any mammal. Males are territorial and patrol the ice edge; they often haul out near females, forming trios. Bulls actively fight among themselves, and can inflict bloody wounds; they routinely display by inflating their nasal bladders and extruding their nasal septum to ward off competing males. They also vocalize at the same time by shaking the balloon violently, producing a loud "pinging" noise. Mating usually takes place in the water.

Hooded seals typically fast during breeding and moulting, but actively feed during much of the rest of the year. Their diet is poorly known, but appears to consist primarily of squids and fishes. It includes both coastal and benthic species, suggesting a coastal distribution for at least part of the year.

**Exploitation:** Like most other Arctic pinnipeds, hooded seals have been hunted by people since prehistoric times. There has also been a long history of commercial sealing for this species, for oil and, particularly for the luxurious coats of the bluebacks. Hooded seals are still hunted in Greenland for meat for humans and dogs, and for pelts. Also, an unknown number are killed every year by incidental entanglement in fishing nets.

**IUCN Status:** Insufficiently known.

***Monachus monachus*** (Hermann, 1779)

PHOC Mona 1

SMM

**FAO Names:** **En** - Mediterranean monk seal; **Fr** - Phoque moine de la Méditerranée; **Sp** - Foca monje del Mediterráneo.

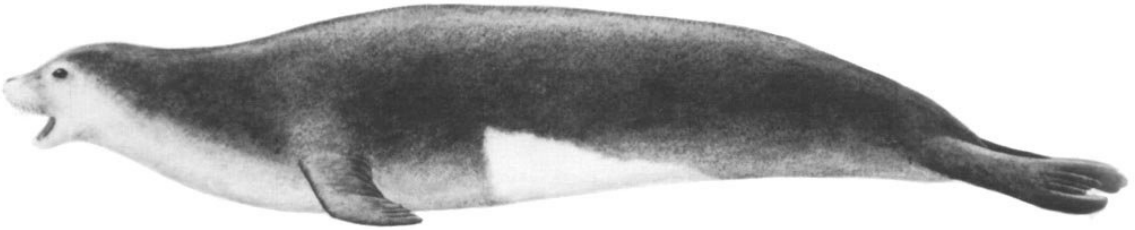


Fig. 550 *Monachus monachus*

**Distinctive Characteristics:** Adult mediterranean monk seals are robust, with short flippers, a long fusiform body, and a proportionately small head. The head is wide and somewhat flat, with the eyes spaced fairly widely. The muzzle is particularly wide, but compressed from top to bottom. The mystacial pads are large, fleshy, and extend beyond the nostrils. The nostrils are situated at the top of the muzzle unlike any other North Atlantic phocid species. The vibrissae are smooth and unbeaded. Females have 4 retractable teats.

Coloration is variable throughout all the now-isolated subpopulations. Most animals are dark brown above and paler below, the colours separated by either a gradual blending or a sharp demarcation. Others are black overall, or very pale silvery white with variable darker blotching. Some animals have a large white belly patch; other have white blotching elsewhere on the body. Pups are born in a woolly blackish coat, sometimes with white spots and irregular blotches, and often with a yellowish white patch below. The moult of pups to a coat of silver-grey above and lighter below occurs at 4 to 6 weeks. Little is known about the seasonality of the moult.

The dental formula is I 2/2, C 1/1, PC 5/5.

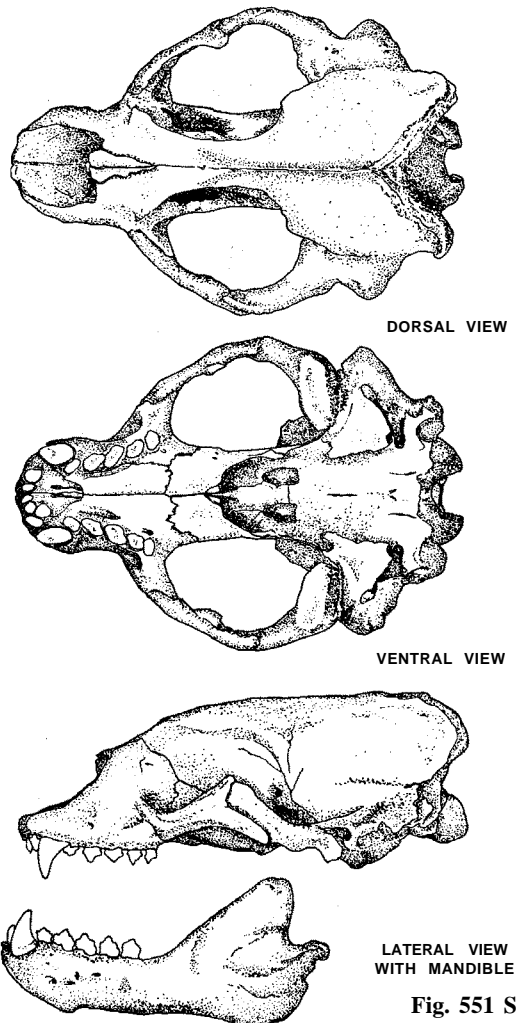


Fig. 551 Skull

**Can be confused with:** Mediterranean monk seals do not regularly share their range with any other pinniped. The nearest regularly occurring species are harbour (p. 258) and grey (p. 272) seals, and hooded seals (p. 276), all of which occur farther north in the Atlantic. However, Mediterranean monk seals can be readily distinguished from all of these species by their lack of spots, characteristics of the head and muzzle, smooth vibrissae, and 4 mammary teats.

**Size:** Adults are up to 2.8 m in length, and weigh 250 to 400 kg. Newborns are 80 to 120 cm and 15 to 26 kg.

**Geographical Distribution:** Mediterranean monk seals are found in the Mediterranean, Aegean, and Black seas, and along northwestern Africa to about 34°N. Their presence on islands far offshore demonstrates at least occasional offshore ventures. On land, they choose rocky coastlines, with a preference for sea caves and grottos that are generally inaccessible from land (and sometimes have only submarine entrances). In West Africa, they come ashore on open beaches.

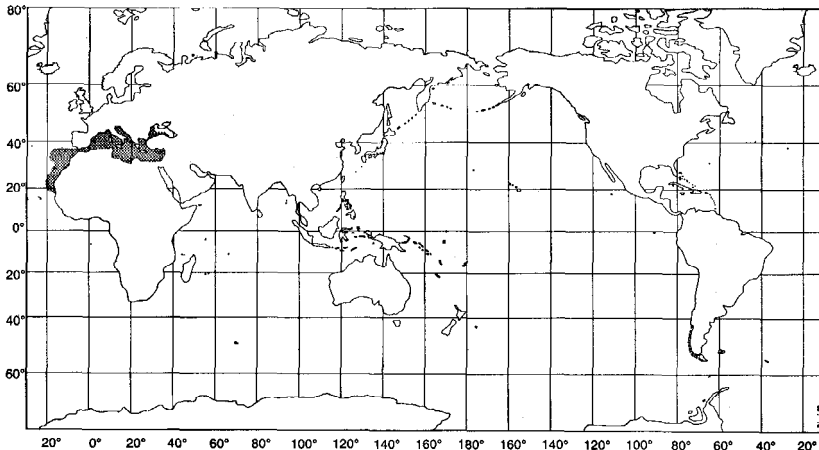


Fig. 552

**Biology and Behaviour:** This seal is considered nonmigratory, spending most of its time within a very limited home range. Breeding occurs much of the year, but mostly from August through October.

Mediterranean monk seals are among the least social of pinnipeds when ashore; they are presumed to be most socially active in the water, where the only copulation ever observed was recorded. Little information is available on diving, but most dives are thought to be shallow, less than 70 m, and short, less than 10 minutes.

The diet consists of octopus, at least 1 type of ray, and a variety of fishes. Large fish that cannot be swallowed whole are brought to the surface and shaken apart.

**Exploitation:** Mediterranean monk seals are highly endangered and their chances for long-term survival are considered poor. They are widely scattered in small groups with little exchange of individuals. These seals have no doubt been taken for food and skins ever since the region has been inhabited by people. There is no record of a systematic commercial hunt, but persistent hunting, and recent poaching in this heavily populated region has likely led to this seal's precarious position. Overfishing, pollution, and development of much of this region are suspected to be significant contributors to the decline as well. It is feared that if Mediterranean monk seals were exposed to a disease like that which decimated populations of harbour and grey seals in northern Europe, it could spell the end of this species.

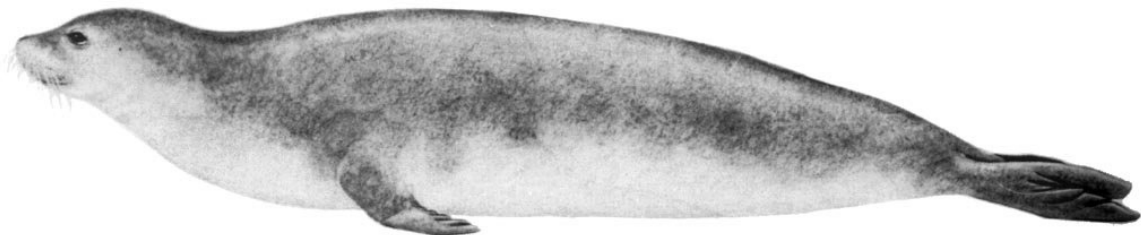
**IUCN Status:** Endangered.

***Monachus tropicalis*** (Gray, 1850)

PHOC Mona 2

SKC

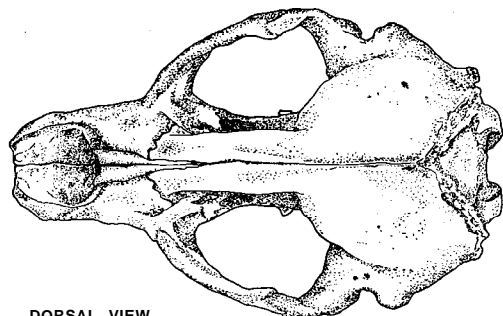
**FAO Names:** **En** - West Indian monk seal; **Fr** - Phoque moine des Caraïbes; **Sp** - Foca monja del Caribe.

Fig. 553 *Monachus tropicalis*

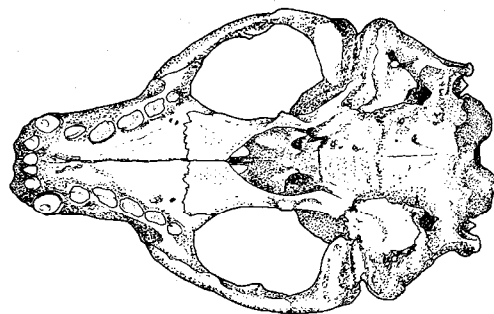
**Distinctive Characteristics:** The West Indian or Caribbean, monk seal is now considered extinct; none have been seen since the early 1950's. It is described here in hopes that some individuals still survive, and can be identified so that they can be adequately protected. Very little is known of the biology or appearance of this seal, but it is believed to have been similar to the Hawaiian (p. 282) and Mediterranean (p. 278) monk seals.

Coloration is said to have been brown above, blending to yellowish white below. No information exists on potential differences between the sexes. Like Hawaiian monk seals, West Indian monk seals were said to occasionally have green algae growing on the pelage. Pup were born in a soft woolly coat that persisted for an unknown period of time.

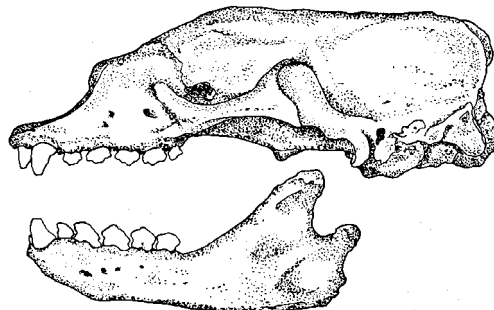
The dental formula is I 2/2, C 1/1, PC 5/5.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW WITH MANDIBLE

Fig. 554 Skull

**Can be confused with:** Feral California sea lions (p. 230) have been reported from the Gulf of Mexico. Hooded (p. 276) harbour (p. 258), and less frequently, harp (p. 268) seals are known to stray occasionally as far south as the central and east coast of Florida, near the edges of the West Indian monk seal's former range. Monk seals can easily be distinguished from all of the above.

**Size:** Adult West Indian monk seals reached at least 2.4 m in length (females may have been slightly larger than males). Hawaiian monk seals of comparable length to the largest reported for West Indian monk seals weigh 170 to 270 kg. Newborns were probably about 1 m and 16 to 18 kg.

**Geographical Distribution:** This monk seal once inhabited the entire Caribbean Sea, ranging northwest to the Bay of Campeche in the Gulf of Mexico. In prehistoric times, it may have reached north to the Bahamas and even South Carolina. There were extralimital records from the southeastern United States.

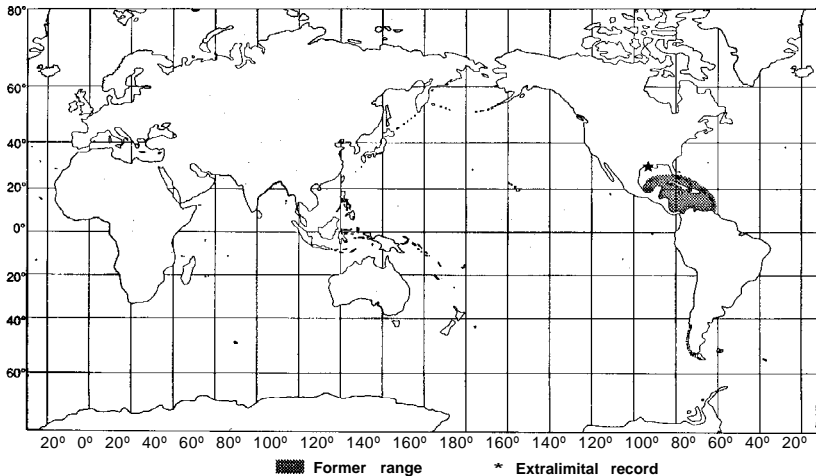


Fig. 555

**Biology and Behaviour:** Evidence from some animals collected in the 19th Century suggested that pups were born in December. Little else is known of this seal's biology, except that they were said to "bark in a hoarse, gurgling, death-rattle tone."

**Exploitation:** This monk seal is now thought to be extinct, in large part because of exploitation by humans. It is the only pinniped species to become extinct in modern times. This seal was likely to have been taken opportunistically by native peoples of the region, although this is not documented. Early explorers took monk seals for meat and fat to produce oil. Soon a thriving seal fishery developed throughout the region and the population was quickly depleted. The last report of a sighting was from Seranilla Bank, between Jamaica and Honduras, in 1952. There have been several surveys since that time and no evidence of the West Indian monk seal has been found.

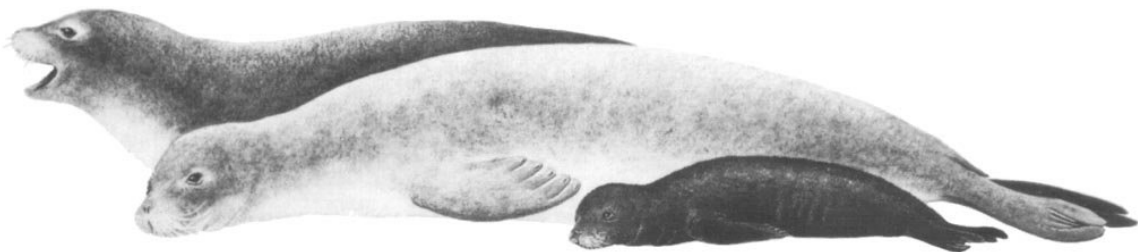
**IUCN Status:** Extinct.

***Monachus schauinslandi*** (Matschie, 1905)

PHOC Mona 3

SMH

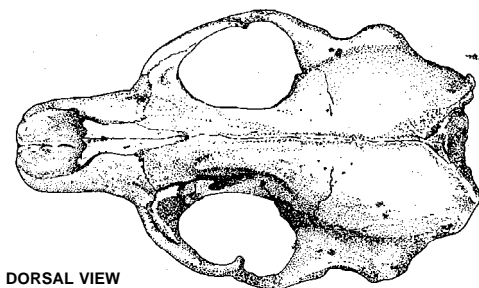
**FAO Names:** **En** - Hawaiian monk seal; **Fr** - Phoque moine de Hawaï; **Sp** - Foca monje del Hawaïi.

**Fig. 556 *Monachus schauinslandi***

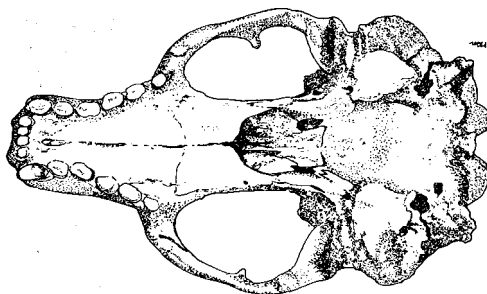
**Distinctive Characteristics:** In Hawaiian monk seals, females grow slightly longer, and often heavier, than males. The long, fusiform body is robust, with short flippers. The relatively small head is wide and somewhat flat, with the eyes spaced fairly widely apart. The muzzle is wide and compressed from top to bottom. The mystacial pads are large and fleshy, extending beyond the nostrils. The nostrils are situated on the top of the muzzle, unlike any other North Pacific phocid species. The vibrissae are smooth, not beaded as in most phocids. They vary from short to moderately long, and are black at the base, often with lighter yellowish white tips. There can be a scattering of all light vibrissae throughout. There are 4 retractable mammary teats.

Just following the moult, most females and subadults are silvery to slate grey above, fading to cream or light silver-grey below. Over the years, the coat usually becomes brownish above and yellowish below. Males and some females become completely brownish to blackish as they age. There can be a variable amount of light highlighting on the mystacial area and on both the upper and lower lips. Adults and juveniles can have a greenish or reddish cast from algal growth. Also, Hawaiian monk seals can have irregular light blotches or patches anywhere on the body and flippers, associated nails may also be pale instead of blackish. Pups are born in a black woolly coat, which is moulted completely by about the sixth week. The first moult is a shedding of individual hairs, but each successive annual moult is a more dramatic epidermal moult of hair and skin, which detaches in patches. Most older animals of both sexes, but especially males, have some to many scars on their back, sides, and head.

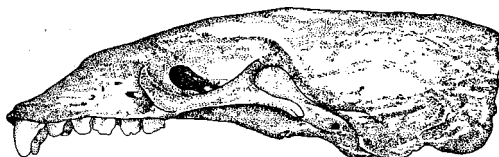
The dental formula is I 2/2, C 1/1, PC 5/5.



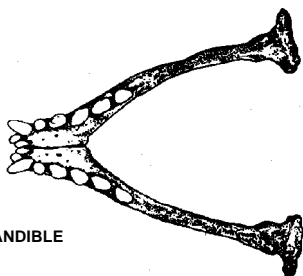
DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW WITH MANDIBLE



DORSAL VIEW OF MANDIBLE

**Fig. 557 Skull**

**Can be confused with:** No other pinnipeds regularly occur within the tropical habitat of this seal. However, in recent years northern elephant seals (p. 284) have been recorded at Midway Island. Northern elephant seals are much larger and the size and shape of the head, muzzle, and orientation of the nostrils are diagnostic. Also, female northern elephant seals have only 2 teats.

**Size:** Adult male Hawaiian monk seals reach lengths of about 2.1 m, females 2.4 m. Males weigh an average of 200 kg, females up to 272 kg. Pups are about 1 m and 16 to 18 kg at birth.

**Geographical Distribution:** Hawaiian monk seals are distributed throughout the northwestern chain of Hawaiian Leeward Islands and are occasionally seen around the main Hawaiian Islands and at Johnston Atoll. Their habitat and movements at sea are not known; they have been seen up to 140 km from the nearest land. On land they haul-out and breed on beaches of sand and coral rubble, and on rocky terraces. They sometimes leave the beach if vegetation is available for shade.

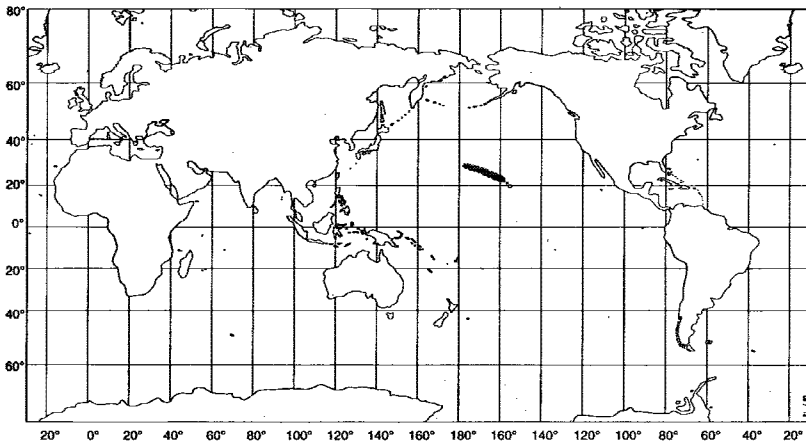


Fig. 558

**Biology and Behaviour:** Hawaiian monk seals are considered nonmigratory. The long breeding season lasts from late December to mid-August, although most pups are born between March and June. Males in this polygynous species patrol the water adjacent to the rookeries, or haul-out beside non-nursing females. There have been up to 3 times more breeding-age males than females at some colonies; this contributes to mobbing of estrus females, which are often injured and occasionally killed.

When approached by another seal or human on land, Hawaiian monk seals often roll to present the underside to the intruder, arch the back, raise a flipper in the air, and open the mouth. They are generally solitary, both on land and at sea. Even when seals gather together on land, they are not generally gregarious, and only mothers and pups regularly make physical contact.

Hawaiian monk seals feed on reef fishes, eels, cephalopods, and lobsters.

**Exploitation:** Hawaiian monk seals were seriously overexploited by sealers and other people in the Hawaiian leeward islands in the early 19th Century. Human disturbance has been nearly continuous since then with guano and bird collectors, lighthouse keepers, military bases and the second world war creating havoc and mortality to varying degrees at the different islands inhabited by these seals. These factors, in combination with shark predation and dinoflagellate toxins passed along to the seals through their fish prey species are suspected to have led to the massive decline in numbers. In recent years entanglement of Hawaiian monk seals in lost and discarded fishing gear and packing bands has also contributed to their decline. With hard work and luck the future for this species may be promising. Estimates of the total population increased in the 1980s to approximately 1 500 animals. This has come about through aggressive protection measures including: placing nearly all of this seal's island habitat under protection of the U. S. Fish and Wildlife Service as a wildlife refuge, and initiating a research and recovery program by the National Marine Fisheries Service.

**IUCN Status:** Endangered.

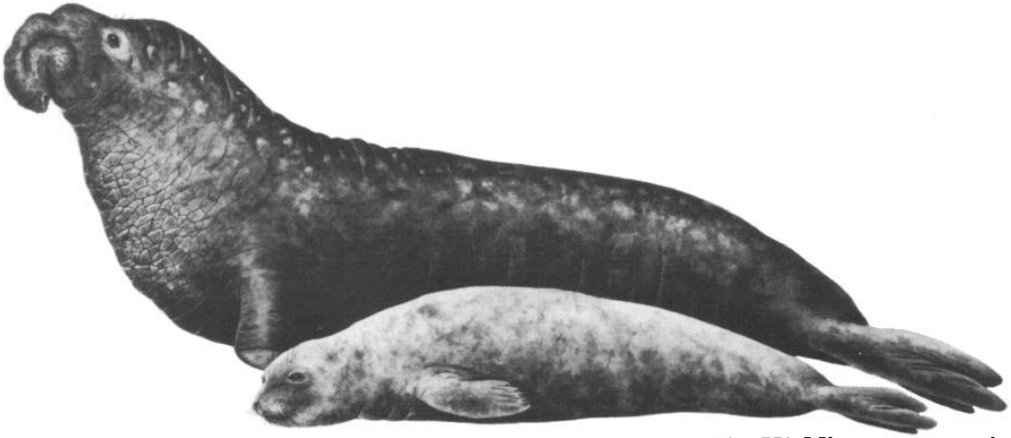


***Mirounga angustirostris*** (Gill, 1866)

PHOC Mir 2

SNP

FAO Names: En - Northern elephant seal; Fr - Elephant de mer boréal; Sp - Foca elephante del norte.

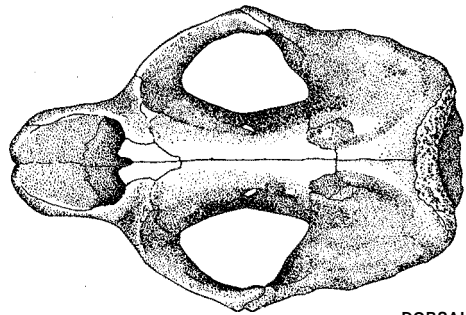
Fig. 559 *Mirounga angustirostris*

**Distinctive Characteristics:** Northern elephant seals are huge and imposing. Significant sexual dimorphism exists in size and shape. In both sexes, the body is long and robust, and the neck very thick. The head, muzzle, and lower jaw are broad. The mystacial area and nose are fleshy and rather pointed on females and young subadult males. The eyes are very large, a feature that is noticeable in females and subadult males. The mystacial vibrissae are beaded, short, and black; they are accompanied by 1 or 2 nose or "rhinal" whiskers, as well as several prominent vibrissae above each eye.

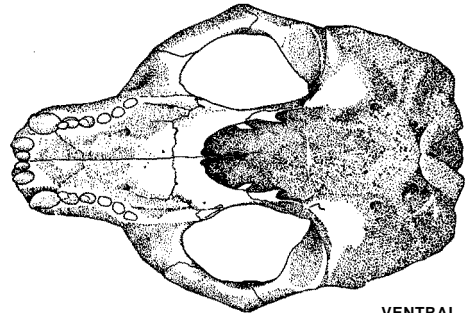
Adult males are unmistakable, because of their great size and large, fleshy nose, called a proboscis. This proboscis is inflatable and, when relaxed, hangs down in front of the mouth. When inflated, it resembles the trunk of an elephant, thus the species' common name. Another feature of bulls is the chest shield, a thickened area of heavily scarred, creased and cornified skin, which on old bulls, completely rings the neck. Each foreflipper digit bears a large blackish brown nail.

Northern elephant seals are uniformly grey, tan, or brown; colour generally fades after the annual moult. Many bulls become pale in the face, proboscis, and head with increasing age; the chest shield and areas of the face and proboscis are often pink. Adults and subadults undergo an epidermal moult that usually starts in the axillary region and progresses around the body. Pups are born in a long woolly black lanugo that is shed at about 3 weeks of age to reveal a silver-grey coat, similar to that of adults.

The dental formula is I 2/1, C I/I, PC 5/5.



DORSAL VIEW



VENTRAL VIEW

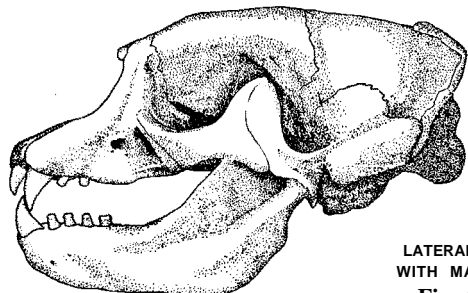
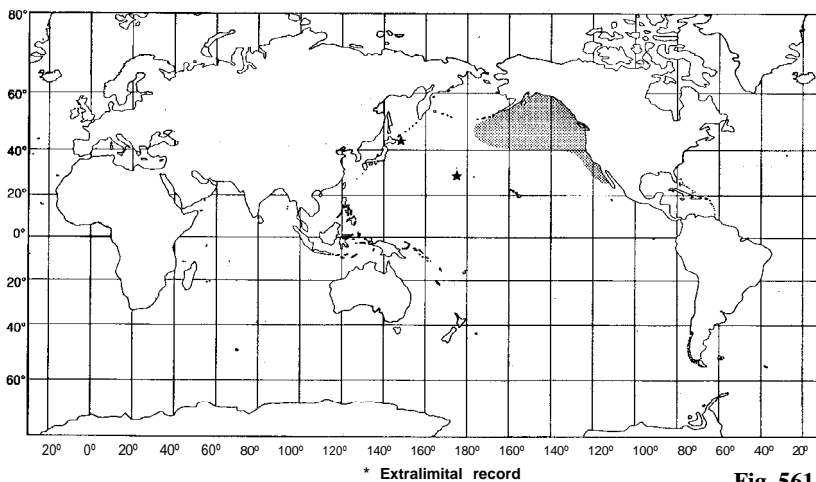
LATERAL VIEW  
WITH MANDIBLE

Fig. 560 Skull

**Can be confused with:** The great size and massive head and large fleshy proboscis of northern elephant seal bulls makes them virtually unmistakable. Only 1 other phocid, the harbour seal (p. 258), regularly shares the range of the northern elephant seal, and is much smaller with a spotted coat. Even female and subadult male elephant seals can be distinguished from other vagrant seals within their range by body size, size and proportions of the head, pelage coloration, prominence and colour of vibrissae, and relative size of the eyes.

**Size:** Adult males reach almost 5 m in length and an estimated 1 800 to 2 200 kg; however, few have been weighed. Adult females are up to 3 m in length and 400 to 800 kg in weight. Newborn pups are about 1.2 m and 30 to 40 kg.

**Geographical Distribution:** The eastern and central North Pacific forms the range of the northern elephant seal. Breeding takes place on offshore islands and a few mainland localities from central Baja California to northern California. Nearly all seals migrate to and from their rookeries twice a year, once to breed (December to March) and later to moult (different times for each age/sex class). Post-breeding and post-moult migrations take most seals north and west to oceanic areas of the North Pacific and Gulf of Alaska. Wanderers have been found as far away as Japan and Midway Island.



**Fig. 561**

**Biology and Behaviour:** Northern elephant seals are highly polygynous, but not territorial. Males compete for access to females by ranking themselves in a hierarchy. There is much male-to-male fighting, vocalizing, and displaying during the breeding season, when bulls may be ashore for months at a time. One of the most impressive displays occurs when a male rears up on his hindquarters, thrusts some two-thirds of his body upward, and produces a distinctive threat vocalization as a challenge to other bulls. Females give birth within a few days of coming ashore, from late December to March.

Northern elephant seals hold the record as the deepest-diving pinniped. Time-depth recording devices have recorded dives of an amazing 1 580 m and 80 minutes. Rest intervals at the surface are very short, usually only a few minutes. After leaving the rookeries, most of these seals spend 80 to 90% of their time underwater, accounting for the fact that they are infrequently seen at sea. Prey consists mostly of squids, small sharks, and deep water fishes.

**Exploitation:** Intensive commercial sealing in the 19th Century greatly reduced the population and these seals have recovered in this century. Sealers were after the great volume of high quality oil that could be obtained from these seals, especially from the bulls. They were thought to be extinct by the turn of the century, but a small number survived the carnage and gave rise to the present burgeoning population.

**IUCN Status:** Insufficiently known.

**Mirounga Leonina** (Linnaeus, 1758)

PHOC Mir 1

SES

**FAO Names:** **En** - Southern elephant seal; **Fr** - Elephant de mer austral; **Sp** - Foca elephante del sur.

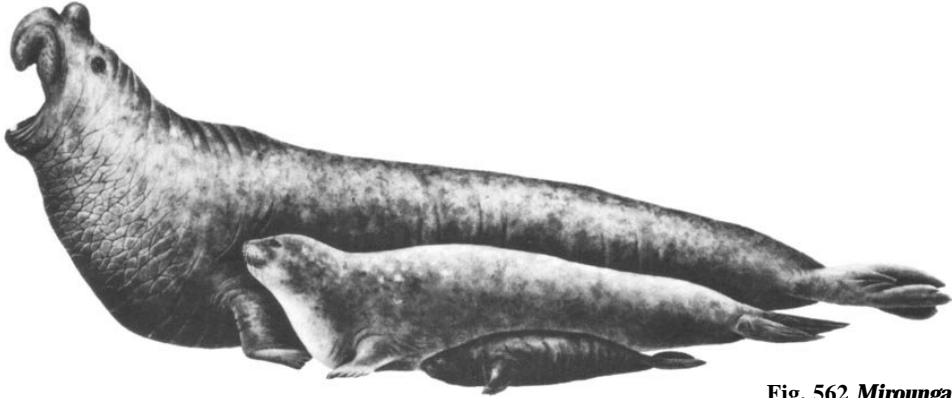
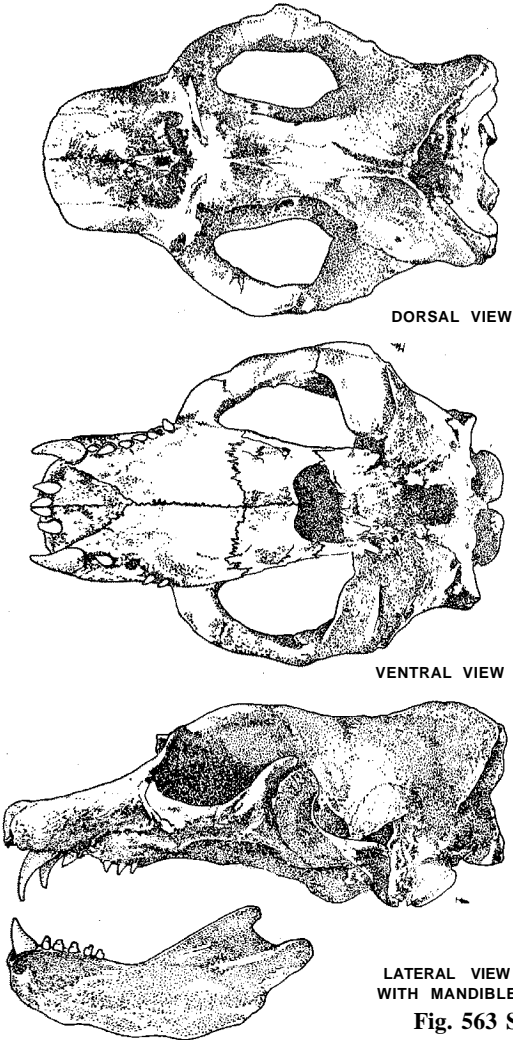


Fig. 562 *Mirounga leonina*

**Distinctive Characteristics:** Southern elephant seals are the largest pinnipeds. They are massive and impressively built in every respect, exhibiting significant sexual dimorphism in size and secondary sexual characteristics. In both sexes, the body is robust and the neck is very thick. The head, muzzle, and lower jaw are broad. The mystacial area and nose are fleshy and very blunt on females and young subadult males. The eyes are large, a feature that is particularly noticeable in females and subadults. The mystacial vibrissae are beaded, short, and black, with 1 or 2 nose, or "rhinal" whiskers off to each side of the muzzle, and up to 7 vibrissae above each eye. Each foreflipper digit bears a large blackish brown nail.

Adult males are unmistakable. The proboscis is erectile. When relaxed, it hangs down in front of the mouth. Curiously, the proboscis is shorter in the southern than in the northern elephant seal, even though the former has a larger body. The proboscis is said to enlarge somewhat during the breeding season. Bulls also develop a chest shield, a thickened area of heavily scarred and creased skin, which also is not as pronounced as in the northern elephant seal. There are various amounts of scarring on the rest of the body, and the proboscis is often heavily scarred or torn. Adult females, and subadults do not have a proboscis, but rather a short nose and muzzle, which with their very wide head gives them a somewhat "pug" appearance.

Elephant seals have an unspotted pelage of light to dark silver-grey, with no difference between top and underside. Some seals are cream grey to brown late in the year. Many bulls become pale in the face, proboscis, and head with increasing age.



DORSAL VIEW

VENTRAL VIEW

LATERAL VIEW  
WITH MANDIBLE

Fig. 563 Skull

Adults and subadults undergo an epidermal moult. Pups are born in a long woolly black lanugo that is shed at about 3 weeks of age, to reveal a silver-grey coat.

The dental formula is I 2/1, CI/I, PC 5/5.

**Can be confused with:** The massive head and the large fleshy proboscis make southern elephant seal bulls virtually unmistakable. All 4 other phocids that occur within the southern elephant seal's range (Weddell [p. 294], Ross [p. 290], crabeater [p. 288], and leopard [p. 292] seals) can be separated from any age southern elephant seal by size and relative proportions of the flippers and head, presence of spotting and streaking (absent on southern elephant seals), and prominence and colour of vibrissae.

**Size:** Adult males reach 5.8 m and 3 000 to 5 000 kg, although few have ever been weighed. Adult females are up to 3 m and 400 to 800 kg, Newborn pups are about 1.3 m and 40 to 50 kg.

**Geographical Distribution:** Southern elephant seals have a nearly circumpolar distribution in the Southern Hemisphere. Although they show up almost anywhere around the Antarctic continent, they are most common north of the seasonally shifting pack ice, especially on subantarctic islands, where most rookeries and haul-outs for moulting are located. Sandy and cobble beaches are preferred, but will haul out on ice, snow, or rocky terraces. They will venture inland into tussock grass and other vegetation, and frequently lie in mud wallows. At sea, females and males may disperse to different feeding grounds.

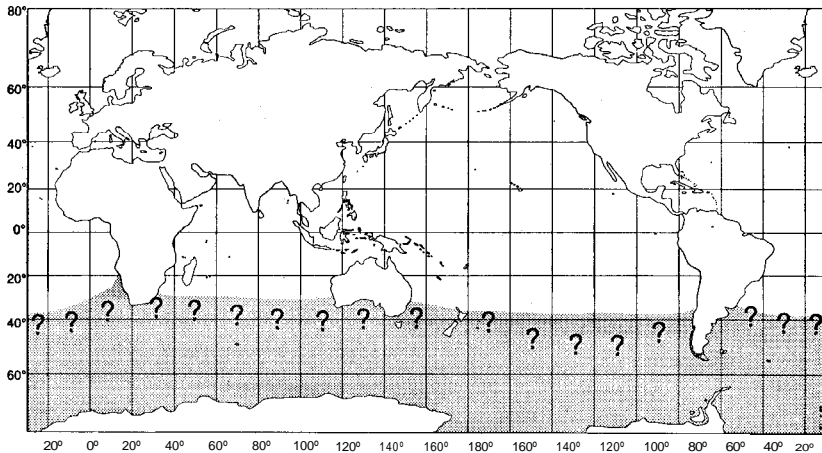


Fig. 564

**Biology and Behaviour:** Elephant seals are highly polygynous and males compete for access to females by roughly sorting themselves in a hierarchy. There is much fighting, vocalizing, and displaying during the breeding season. One of the male's most impressive displays is achieved by rearing up on his hindquarters, lifting some two-thirds of his bulk, and vocalizing as a challenge to other bulls.

Southern elephant seals are remarkable breath-holders; instrumented adult females have remained underwater for 120 minutes and have reached depths of 1 255 m. Both sexes dive nearly continuously while at sea, spending only a small fraction of time at the surface. Prey consists of approximately 75% cephalopods and 25% fish.

**Exploitation:** Intensive commercial sealing greatly reduced the populations of southern elephant seals and eliminated them from some rookeries, which they have yet to recolonize. The industry was based on the great volume of high quality oil that could be obtained from these seals, especially the bulls. "Elephanting" was in its heyday throughout the 19th Century, with little or no control, and continued until 1964 at South Georgia under a management scheme. Colonies on subantarctic islands in the Indian Ocean area are generally declining for unknown reasons. As with all pinnipeds inhabiting Antarctic regions, southern elephant seals are protected by the Convention for the Conservation of Antarctic Seals.

**IUCN Status:** Insufficiently known.

***Lobodon carcinophagus*** (Hombron and Jacquinot, 1842)

PHOC Lob 1

SET

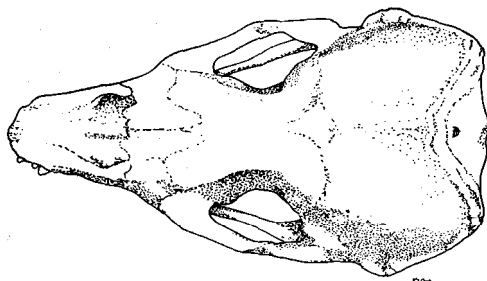
**FAO Names:** En - Crabeater seal; Fr - Phoque crabier; Sp - Foca cangrejera.



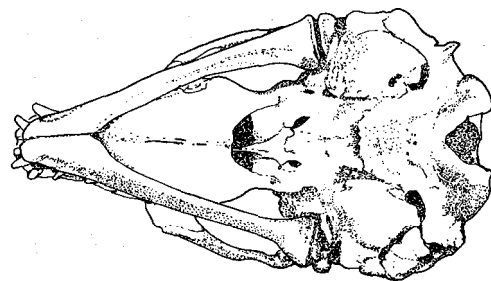
**Fig. 565 *Lobodon carcinophagus***

**Distinctive Characteristics:** In Crabeater seals, the head and muzzle are moderately long and thin relative to the animal's overall size. The eyes are set fairly far apart and the head tapers to the base of the straight muzzle, forming a slight forehead in profile. The nostrils are on top of the muzzle, just back from the end. The line of the mouth is virtually straight. The vibrissae are short, pale to clear, and inconspicuous. The foreflippers are long, oar shaped, and pointed, like those of otariids. The first digits are elongated and robust, and the fifth digit is reduced. Many crabeaters bear long dark scars, either singly or as a parallel pair, attributable to attacks by leopard seals.

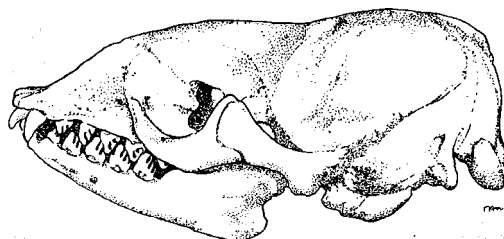
The coat of a freshly moulted crabeater has a rich sheen, with light to dark tones of silvery grey to yellowish brown. There are irregular patches of spots and rings, often in clusters on the sides, flippers, and around the insertions of the flippers. These markings produce a reticulated, or web-like, pattern on many crabeaters. The flippers can be so heavily marked with spots and rings that they appear darker than the rest of the body. As the year progresses, crabeaters fade dramatically, virtually eliminating the contrast between top and bottom. As these seals become older they become paler overall, and some look faded all year. Pups are born with a soft woolly coat that is greyish brown, with darker colouring on the flippers. Moulting begins in about 2 to 3 weeks and the pup sheds into a subadult pelage similar to that of the adult. Most crabeaters have at least a few and often many long scars on the body, which are most often seen in pairs, parallel or near to each other. These scars are thought to be the result of unsuccessful leopard seal attacks on the seals as juveniles.



DORSAL VIEW WITH MANDIBLE



VENTRAL VIEW WITH MANDIBLE



LATERAL VIEW WITH MANDIBLE

**Fig. 566 Skull**

Additionally many older animals are extensively scarred on the neck, face, and around the lower jaws.

All of the post-canine teeth are ornate, with multiple accessory cusps. Upper and lower teeth interlock to form a network for straining krill from the water. The dental formula is I 2/2, C 1/1, PC 5/5.

**Can be confused with:** Crabeater seals are most likely to be confused with leopard (p. 292) and Weddell (p. 294) seals. The former has a massive reptilian head, long foreflippers, and huge maw. The latter has a very small head, relative to the rotund body, and a distinctly spotted coat. Only crabeaters occur routinely in large groups.

**Size:** Adults reach 2.6 m in length and, although little data is available, weigh an estimated 200 to 300 kg. Neonates are thought to be at least 1.1 m and 20 to 40 kg.

**Geographical Distribution:** The distribution of crabeater seals is tied to the seasonal fluctuations of the pack ice. They can be found right up to the coast of Antarctica, as far south as McMurdo Sound, during late summer ice break-up, and as vagrants as far north as New Zealand and the lower reaches of Africa, Australia, and South America.

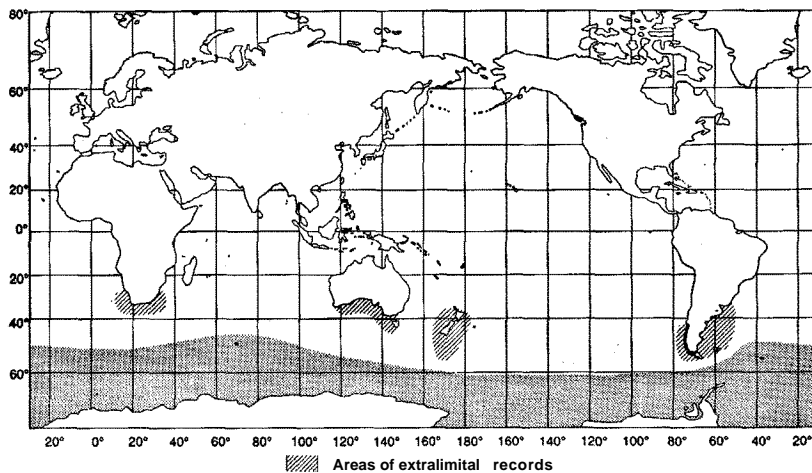


Fig. 567

**Biology and Behaviour:** Pups are born from September to December, and mating most likely occurs from October through December (although little is known about their reproduction). There are no specific rookeries: females haul out on ice, give birth, and aggressively ward off other seals, particularly males.

Crabeaters are frequently encountered alone or in small groups of up to 10 on the ice or in the water. However, much larger groups of up to several thousands have been observed. Occasionally, they can be seen traveling together in herds, breathing and diving almost synchronously. They are known for their ability to move rapidly on ice, with sinuous serpentine motions of the back, aided by the flippers. When agitated, their response is to arch their back and raise their neck and head, and often point the nose upwards at a slight angle in an alert posture.

Recent research has revealed that crabeater seals can dive to 430 m and for 11 minutes, although most feeding dives were much shallower and shorter. It is believed that crabeaters feed with greatest intensity at night, mostly on krill.

**Exploitation:** Crabeater seals have never been seriously exploited by humans. They continue to be taken for scientific research and to feed sled dogs kept at Antarctic bases. They are probably the most numerous pinniped, and may be the most numerous large mammal on earth besides humans. It has been speculated that the population of crabeater seals is at an all time high due to the demise of the large stocks of krill-eating baleen whales.

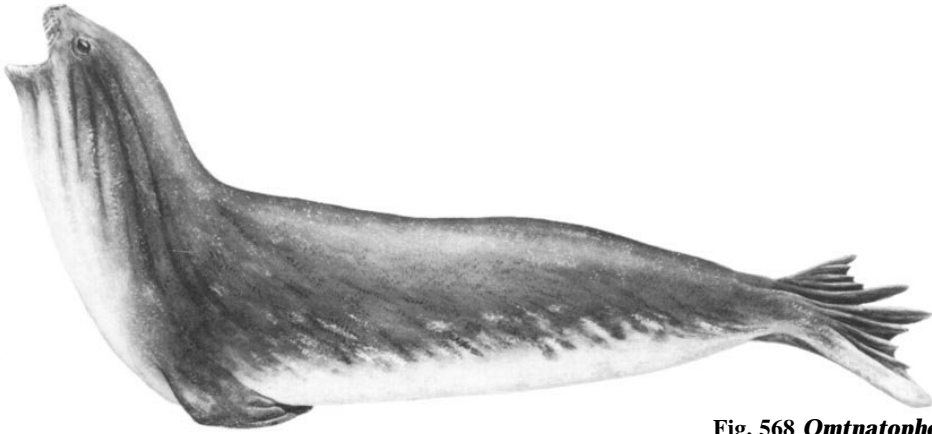
**IUCN Status:** Insufficiently known.

***Ommatophoca rossii*** (Gray, 1844)

PHOC Omn 1

SRS

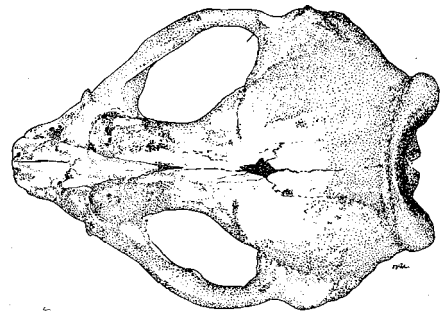
FAO Names: En - Ross seal; Fr - Phoque de Ross; Sp - Foca de Ross.

Fig. 568 *Ommatophoca rossii*

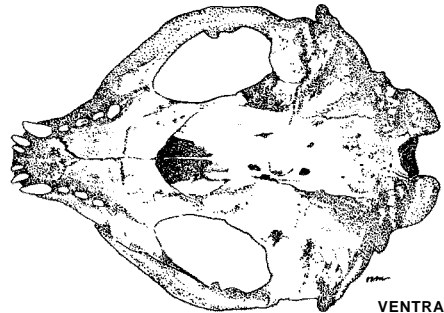
**Distinctive Characteristics:** Ross seals are poorly known. They are the smallest of the Antarctic phocids. The head is relatively wide and short. The muzzle is likewise short, wide, and comes to a blunt end. The small number of short, slender vibrissae are possibly the shortest of any pinniped. The eyes are set widely apart and are average in size, despite the huge orbits in the skull. The throat and neck are quite thick, but the rest of the body is of average build for a phocid. The coat is the shortest of any phocid. The hindflippers are very long, just over one-fifth of the standard length.

Ross seals are typically countershaded, dark grey above, blending along the sides, and becoming silvery below. Most striking are the beautiful brown to reddish brown streaks, unique to this pinniped, extending parallel to the long axis along the neck, chest, and sides. The face may appear masked as a result of the merging of streaks at the eyes and on the lower jaw. There may also be spots, particularly on the sides. Ross seals may have something like an epidermal moult that involves shedding small pieces of skin. Small scars are often seen on the neck, possibly from intraspecific fighting, and some adults bear larger scars, probably from leopard seal or killer whale attacks.

The dental formula is I 2/2, C 1/1, PC 5/5.



DORSAL VIEW



VENTRAL VIEW

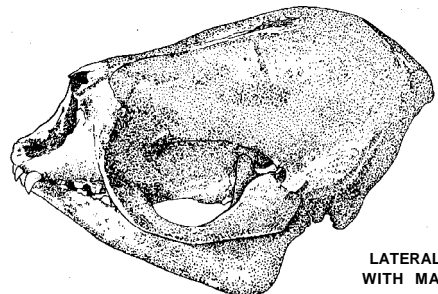
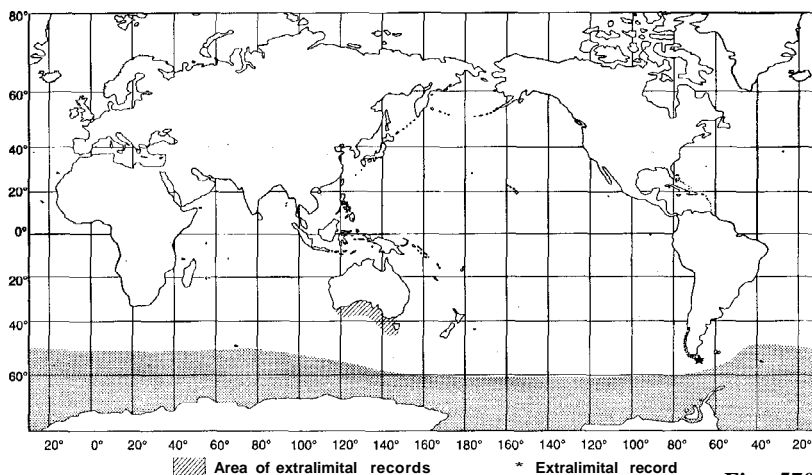
LATERAL VIEW  
WITH MANDIBLE

Fig. 569 Skull

**Can be confused with:** Of the 4 other phocids that share the Ross seal's range (Weddell (p. 294), crabeater (p. 288), leopard (p. 292), and southern elephant (p. 286) seals), the Weddell is most similar in appearance. However, Ross seals are much smaller and have a wider head, and relatively thicker neck (with streaks). Ross seals also tend to be found deeper into the thick pack ice than any other Antarctic phocid.

**Size:** Based on a small sample of measured animals, Ross seals reach at least 2.4 m and 204 kg. Females are slightly larger than males. It is estimated that newborn pups are about 1 m and 16 kg.

**Geographical Distribution:** Ross seals have a circumpolar distribution in the Antarctic. They are usually found in dense consolidated pack ice, but can also be found on smooth ice floes in more open areas.



**Fig. 570**

**Biology and Behaviour:** Breeding is thought to occur from November through December. When hauled-out, Ross seals are generally encountered alone. Occasionally, a small number of individuals may be found in the same area, but they are usually widely spaced. They may haul out more from morning to late afternoon. However, during the period of the moult, they may be out of the water for longer periods.

Few behaviours have been noted, except for the interesting habit of raising up the head and neck when approached by a human. The seal either stays on its belly or rolls onto its side, keeping the belly towards the person. In this "singing" posture, it opens the mouth to produce trilling, siren-like calls, or chugging vocalizations.

Little is known of the activities of Ross seals in the water, although recent work has revealed that dives average 100 m and 6 minutes. The diet of Ross seals consists primarily of cephalopods, but also includes fishes and krill in some areas.

**Exploitation:** Ross seals have never been the target of anything but small scale and incidental sealing. Very few have ever been taken for research, and they are poorly represented in scientific collections. This is arguably the most inaccessible seal to humans, and explains the limited exploitation and paucity of knowledge available.

**IUCN Status:** Insufficiently known.



***Hydrurga leptonyx*** (Blainville, 1820)

PHOC Hydr 1

SLP

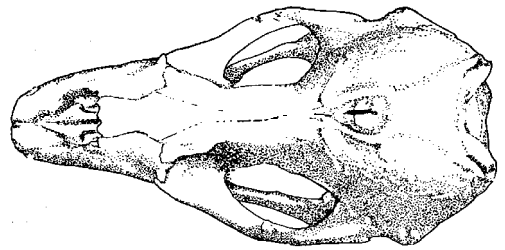
FAO Names: En - Leopard seal; Fr - Leopard de mer; Sp - Foca leopardo.



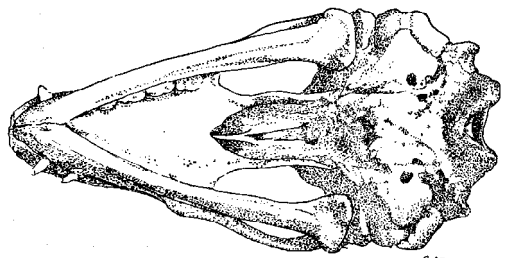
Fig. 572 *Hydrurga leptonyx*

**Distinctive Characteristics:** Leopard seals have a sinuous body and massive head and jaws. Because of the shape of the head, they appear almost reptilian. Females grow slightly longer and heavier, but not enough to allow the sexes to be distinguished in the field based on size. The long body is thin overall, thickest through the shoulders and upper chest. There is no trace of a forehead. The head is widest at the eyes, which appear small and set both far apart and well back from the end of the muzzle. The nostrils are on top of the muzzle, just back from the wide rounded end. The lower jaw is massive, wide, and deep, as are the throat and neck. The vibrissae are clear to pale, generally quite short and inconspicuous. Leopard seals have an enormous gape. The very long (almost one-third of the body length) foreflippers are broad and otariid-like. They are completely furred and each digit bears a short terminal claw. The first digit is long and massive, creating a thick strong leading edge.

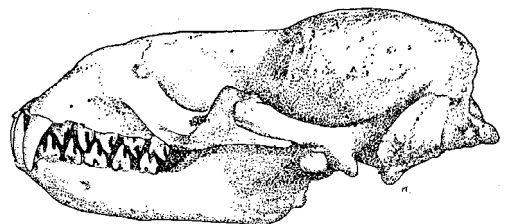
Leopard seals are basically countershaded. The darker top is silver to dark grey, and it blends along the midsides and neck at about the level of the eyes with the paler undersides, which are light grey. There is a swath of lighter colour on the upper lip. Leopard seals are spotted to varying degrees, usually most noticeably on the sides and belly. Pups have essentially the same markings and proportions as adults, although their coat is softer, longer, and thicker. Dense constellations of spots may occur without any pattern or symmetry. One area where dense clusters of spots normally occurs is around the insertions of the foreflippers.



DORSAL VIEW WITH MANDIBLE



VENTRAL VIEW WITH MANDIBLE



LATERAL VIEW WITH MANDIBLE

Fig. 571 Skull

The dental formula is I 12/2, C 1/1, PC 5/5. The canine teeth are very long (up to 2.5 cm) and sharply pointed. The remaining teeth are complex and multi-lobed, somewhat resembling those of crabeaters.

**Can be confused with:** When seen well, leopard seals are unmistakable. At a distance, however, they might be confused with crabeater (p. 288) or Weddell (p. 294) seals. Of these, the crabeater is the most likely candidate for confusion. To rule out other species, note the size and shape of the head, overall coloration, and length of the foreflippers.

**Size:** Adults usually reach 3 m and weigh 270 to 450 kg. Very large females may reach 3.6 m and 500 kg. Pups are born at about 1 to 1.6 m and around 30 to 35 kg.

**Geographical Distribution:** Leopard seals are widely distributed in the polar and subpolar waters of the Southern Hemisphere, from Antarctica north, and regularly reach warm temperate latitudes as vagrants. They are found throughout the pack ice zone, where their abundance is greatest. They haul-out on ice and land, often preferring ice floes, when available.

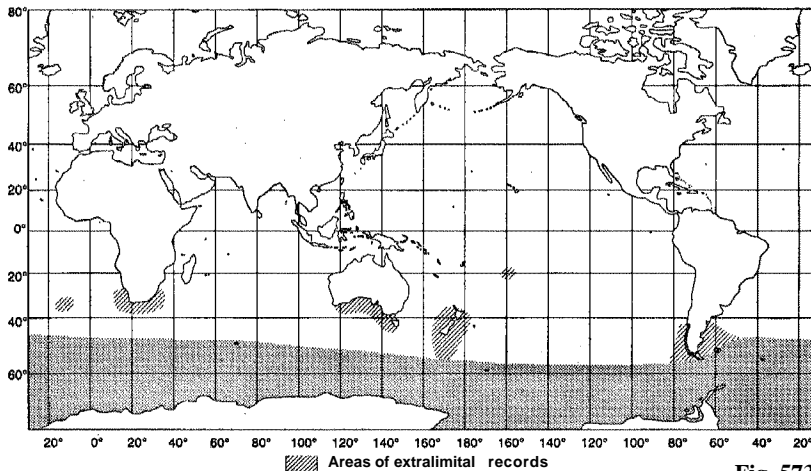


Fig. 573

**Biology and Behaviour:** Little is known of breeding behaviour. Pups are born on the ice from September to January, with a peak in November to December.

At sea and on the ice, leopard seals tend to be solitary. They float at the surface, and crane their neck high to view objects of interest. Sounding in this species is commenced either by sinking or rolling forward. Swimming is most often accomplished with long, powerful, coordinated sweeps of the foreflippers, rather than the side-to-side strokes of the hindflippers typical of most phocids. Leopard seals mostly sleep or are otherwise inactive when out of the water, but will move in a serpentine slithering manner across ice, and will toboggan like penguins.

Leopard seals are probably best known for their habits of preying upon penguins. The diet is actually quite varied and changes with seasonal and local abundance of prey. Leopard seals will consume krill, fish, squid, penguins, and young seals, and will occasionally scavenge from carcasses of whales. Most prey is caught in the water.

**Exploitation:** Leopard seals are only taken in small numbers for scientific research and have never been the target of more than minor commercial activities.

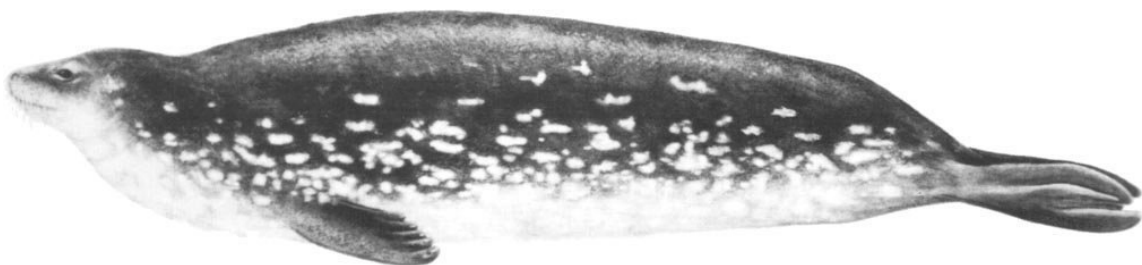
**IUCN Status:** Insufficiently known.

***Leptonychotes weddellii*** (Lesson, 1826)

PHOC Lept 1

SLW

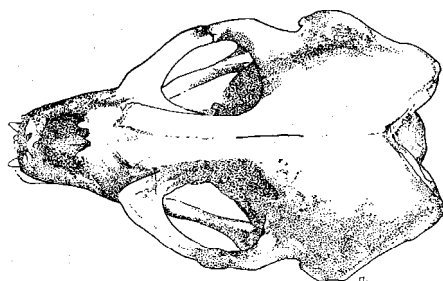
FAO Names: En - Weddell seal; Fr - Phoque de Weddell; Sp - Foca de Weddell.

Fig. 574 *Leptonychotes weddellii*

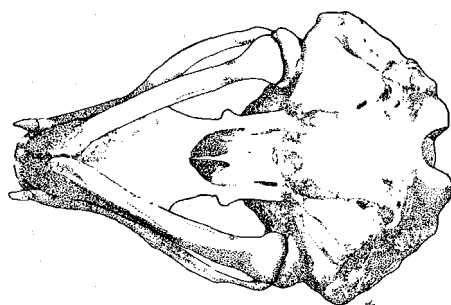
**Distinctive Characteristics:** Female Weddell seals tend to be slightly larger and heavier than males, but not enough to distinguish the sexes. Much of the year the body is sufficiently plump that the head appears disproportionately small. However, extensive weight loss during the spring breeding season makes the size of the head less useful. There is no discernable demarcation of the forehead. Several features contribute to a cat-like appearance: the very short and blunt muzzle, large and fairly close-set eyes, a sparse number of inconspicuous short vibrissae, and a mouthline that is turned up at the corners. The foreflippers are more pointed and angular than those of northern phocids, and are proportionately the shortest of any antarctic phocid.

Adults are generally dark silver-grey above and off-white below, with variable spotting, streaking, and blotching. These markings are lighter on the back, heavier on the sides, and sometimes continuous on the undersides. Dorsal colour progresses from bluish black just after moulting to brownish grey just prior. The muzzle, from the nostrils to the mouth and mystacial area, is usually pale, as are crescent-shaped markings over the eyes. Pups are born in a woolly silver-grey coat, with a darker swath along the midline of the back. They shed the lanugo for the adult pelage in 1 to 4 weeks.

The dental formula is I 2/2, C1/1, PC 5/5.



DORSAL VIEW WITH MANDIBLE



VENTRAL VIEW WITH MANDIBLE



LATERAL VIEW WITH MANDIBLE

Fig. 575 Skull

**Can be confused with:** Of the 4 phocids that share the Weddell seal's range, Ross (p. 290) and crabeater (p. 288) seals are the most similar (leopard and southern elephant seals are easy to distinguish). Note the proportionately larger and wider neck and head, and stripes of the Ross seal; and for the other species, characteristics of the muzzle, head, neck, colour pattern, flippers, and vibrissae.

**Size:** Adult males reach 2.9 m in length, females 3.3 m. Adults in their prime weigh 400 to 450 kg, with a wide seasonal fluctuation. Newborns are 1.5 m long and average 29 kg.

**Geographical Distribution:** Circumpolar and widespread in the Southern Hemisphere, Weddell seals occur in large numbers on fast ice, right up to the Antarctic continent, and offshore through the pack ice to the seasonally shifting limits of the Antarctic Convergence, including many seasonally ice-free islands along the Antarctic Peninsula.

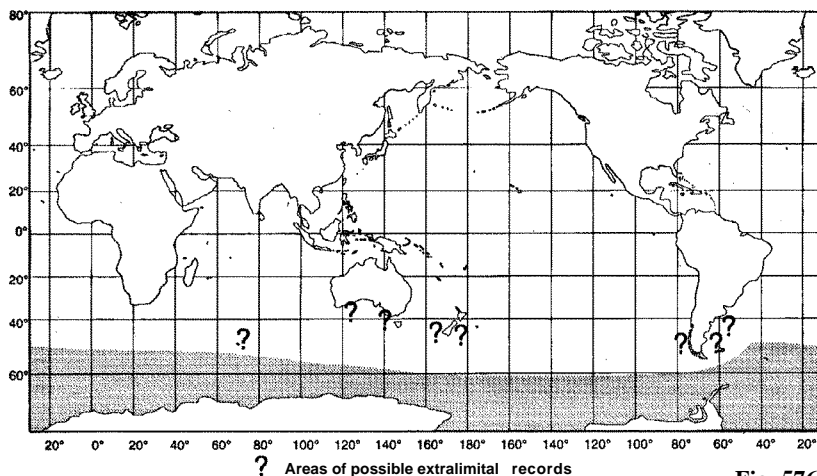


Fig. 576

**Biology and Behaviour:** Weddell seals breed from September through November, depending on the locality; those in lower latitudes pup earlier. Males set up territories in the water around access holes in the ice used by females.

Weddell seals are not very social when out of the water, avoiding physical contact most of the time. The only copulation that has been observed occurred underwater. They may congregate in groups on fast ice near access holes to the water. If disturbed when out of the water Weddell seals often roll onto a side and arch their neck and chest, raising the head to look around. There is some debate over whether or not this species is migratory. Some individuals remain in residence year round in the fast ice. Others, particularly newly weaned and subadult animals, move north from the continent into the winter pack ice.

Weddell seals can dive very deeply (to 700 m), and to hold their breath for up to 82 minutes. The deep diving abilities are helpful in finding breathing holes and obtaining important prey such as the huge Antarctic cod. The diet of Weddell seals consists mostly of fish, with smaller amounts of squid and other invertebrates rounding out their fare.

**Exploitation:** Weddell seals have never been exploited by full-scale commercial sealing. Throughout the Antarctic they have been relied upon by early explorers and scientific programmes as a food source for people, and more recently for sled dogs. Small numbers are regularly taken for research purposes. These and all other Antarctic seals are protected by the Convention on Conservation of Antarctic Seals.

**IUCN Status:** Insufficiently known.

## 4.2 OTHER MARINE CARNIVORES - Sea otters, Marine otters, and Polar bears

By far, most carnivores are terrestrial mammals. Besides pinnipeds, the Order Carnivora contains 7 families of largely meat-eating mammals, including cats, dogs, bears, raccoons, weasels, otters, civets, and hyenas. Of these, only 2 families contain marine mammal representatives, the Mustelidae (otters and weasels) and the Ursidae (bears). As only 3 of these 231 non-pinniped species of carnivores are marine mammals, we will not present the detailed characteristics of members of this order.

### 4.2.1 Guide to Families

#### MUSTELIDAE

The mustelids are the otters, weasels, and their kin. Other mustelids include the minks, polecats, martens, wolverines, Skunks, and badgers. Only 2 of the 67 species in this family are truly marine, the sea otter and the marine otter. It is clear that "fresh-water" otters in certain areas enter marine waters; however, we restrict our treatment to species usually considered among marine mammals. Otters are often classified in their own subfamily, the Lutrinae (containing 12 species).

**Otters** (2 marine species in 2 genera) p. 298

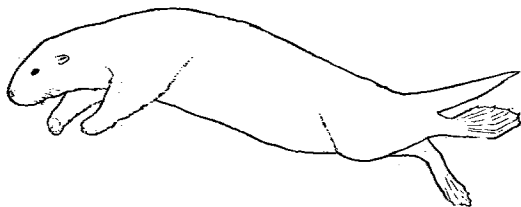


Fig. 577 Mustelidae

#### URSIDAE

There are 7 species of bears in the world and 6 are wholly terrestrial. Bears are very familiar animals to many people. In particular, the grizzly, brown, and black bears of the Northern Hemisphere are often exhibited in zoos and are well-known. The single marine species, the polar bear, qualifies as the least aquatic of all marine mammals.

**Bears** (1 marine species in 1 genus) p. 302

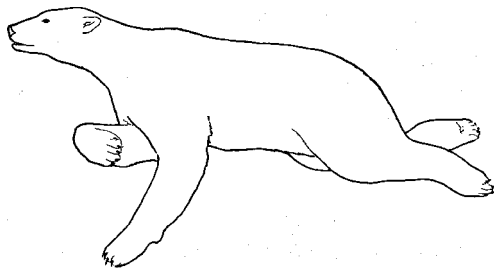


Fig. 578 Ursidae

#### 4.2.2 FAO Species Identification Sheets

***Enhydra lutris*** (Linnaeus, 1758)

**MUST Enhy 1**

**OTS**

**FAO Names:** **En** - Sea otter; **Fr** - Loutre de mer d'Amérique du Nord; **Sp** - Nutria marina.

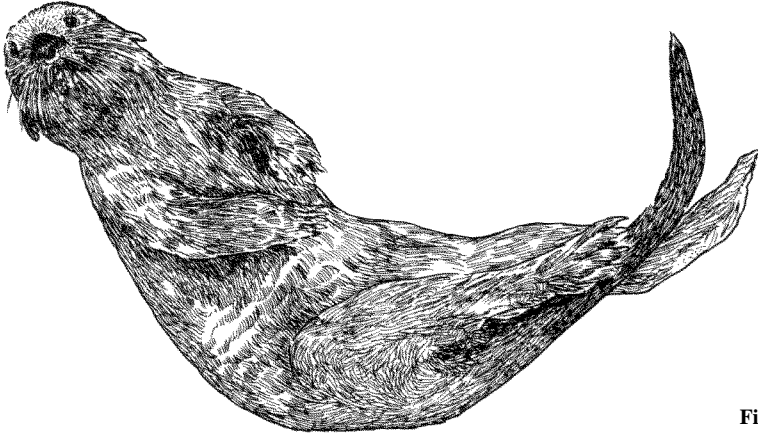
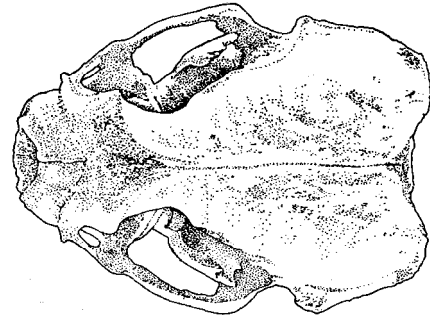


Fig. 579 *Enhydra lutris*

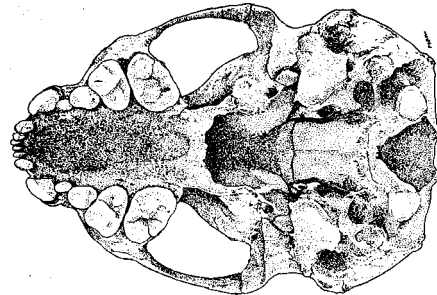
**Distinctive Characteristics:** The sea otter is the most derived of the otters. The muzzle has a set of thick vibrissae. The large head has a blunt snout, and is connected to the body by a short, stocky neck. The forelimbs are short and similar to those of other otters, with a loose flap of skin under each that is used to store food. The hindlimbs are large and flattened like flippers; they are oriented backwards. Although the short tail is not noticeably tapered, it is flattened top to bottom into a paddle-like structure. Three subspecies are currently recognized (described below).

The pelage of sea otters is the densest of any mammal (more than 100 000 hairs/cm<sup>2</sup>). A layer of sparse guard hairs overlays the dense underfur. Sea otters are completely covered with fur, except for the nose pad, inside of the ear flaps, and the pads on the bottom of the feet. The colour of the fur is dark brown to reddish brown. Older individuals become grizzled, with the fur around the head, neck, and shoulders becoming almost white.

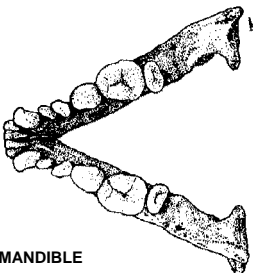
The dental formula is I 3/2, C 1/1, PM 3/3, M 1/2.



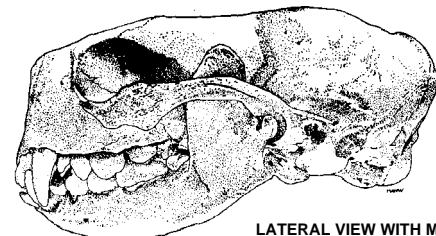
DORSAL VIEW



VENTRAL VIEW



DORSAL VIEW OF MANDIBLE



LATERAL VIEW WITH MANDIBLE

Fig. 580 Skull

**Can be confused with:** The sea otter is the only truly marine otter in its range, although North American river otters (*Lutra canadensis*) are often found in marine waters along the northwest coast of North America. River otters are smaller and more slender than sea otters, with longer tails. Also, river otters generally swim belly down even at the surface, while sea otters usually move along the surface on their backs.

**Size:** Male sea otters reach lengths of 148 cm and weights of 45 kg. Females can be up to 140 cm and 32.5 kg. Newborns weigh about 1.0 to 1.9 kg.

**Geographical Distribution:** Sea otters are found in shallow, nearshore waters of the North Pacific Rim, from the southern Kurile Islands, north along the Aleutian Islands, and thence south to southern California. Originally, their distribution was nearly continuous from Hokkaido, Japan, to central Baja California, Mexico. However, there are now 4 disjunct remnants: Kurile Islands to southeast Kamchatka Peninsula (classified as *E. 1. gracilis*); Commander Islands; Aleutian Islands to Prince William Sound, Alaska (these 2 groups are classified as *E. 1. lutris*); and central California (classified as *E. 1. nereis*). In addition, there have been several reintroduction attempts (some successful, others not) along the west coast of North America.

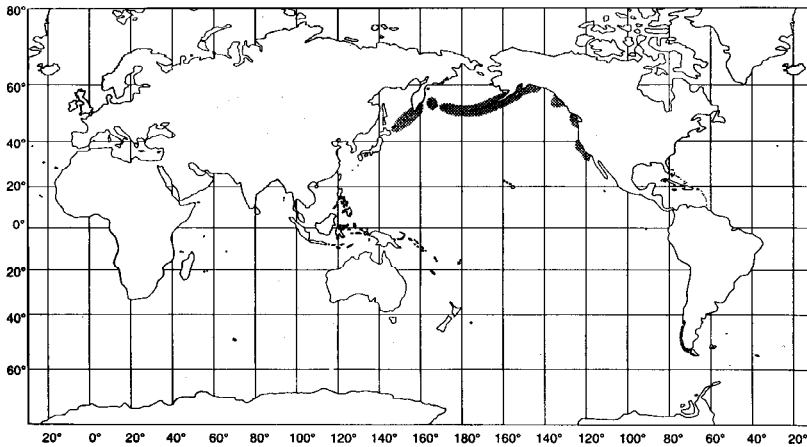


Fig. 581

**Biology and Behaviour:** Sea otters can be seen singly or in groups (most often resting groups called rafts). Rafts in California rarely exceed 50 individuals, but those in Alaska can contain up to 2 000 otters.

Sea otters are polygynous: males tend to defend large territories that encompass the ranges of several females. Pupping occurs throughout the year, but peaks in May to June in Alaska, and in December to February in California. During mating, the male bites the nose of the female to position himself; thus, females often have nose scars (these are useful to researchers in identification of individuals).

Sea otters feed on or near the bottom in shallow waters (often in kelp beds). Major prey items are benthic invertebrates such as abalones, sea urchins, and rock crabs. However, sea otters also eat other shellfishes, cephalopods, and sluggish near-bottom fishes.

**Exploitation:** Sea otters have been commercially hunted since the 1700s, mostly for their pelts. All 3 subspecies were significantly reduced. Protection was finally afforded in some areas near the turn of this century. Oil spills and catches in net are the major remaining threats.

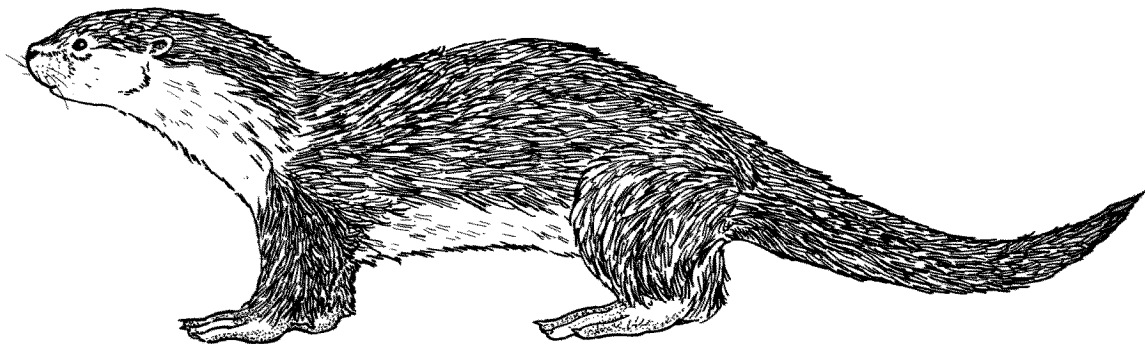
**IUCN Status:** Not listed.

***Lutra felina*** (Molina, 1782)

**MUST** Lutra 1

**OTM**

**FAO Names:** En - Marine otter; Fr - Loutre de mer; Sp - Nutria de mar.

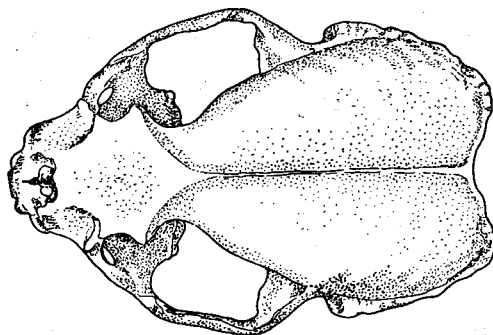


**Fig. 582 *Lutra felina***

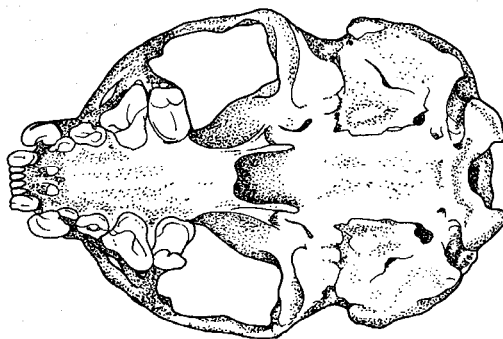
**Distinctive Characteristics:** Marine otters are very similar in appearance to freshwater otters. The snout is blunt at the tip and the nose pad is naked and relatively flat. The tail tapers to a point, typical of freshwater otters. The well-webbed feet are of moderate size, with strong claws. The coarse pelage looks rough; it has a dense underfur and a set of long guard hairs (up to 20 mm long).

Marine otters are dark brown above, a lighter fawn colour below. The muzzle, throat, and lips are not spotted, as in some other otter species. The nose pad is black, and variations in its structure may be useful in indicating stocks of marine otters (nose pad variations are used to distinguish different species within the otter subfamily).

The dental formula is I 3/3, C 1/1, PM 3-4/3, M 1/2.



**DORSAL VIEW**



**VENTRAL VIEW**

**Fig. 583 Skull**



**Can be confused with:** This is the only truly marine otter along the west and southwest coasts of South America, although there are southern river otters (*Lutra provocax*) along some parts of the coast and marine otters enter rivers. The river otters can be distinguished by their larger size, darker colour, finer fur, and peaked nose pads.

**Size:** Marine otters attain total lengths (including the tail) of slightly over 1 m, and weights up to 4.5 kg.

**Geographical Distribution:** These coastal otters are found on exposed rocky shores from the southern tip of Chile to southern Peru. They have been extirpated from Argentina.

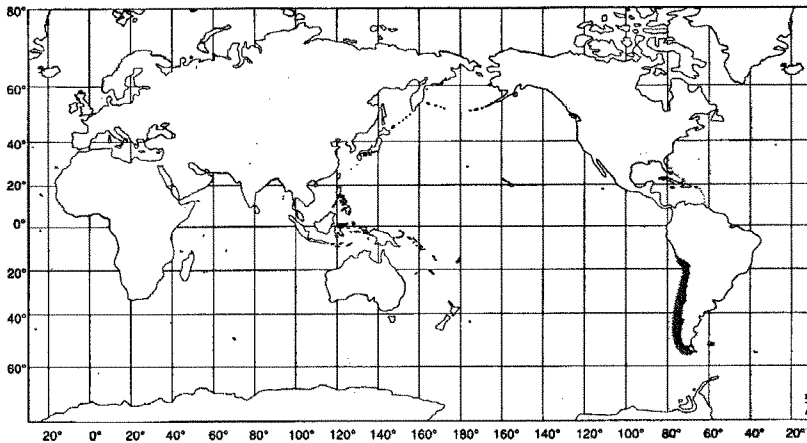


Fig. 584

**Biology and Behaviour:** Very little is known of the biology of the marine otter. They are found mostly singly or in pairs, but groups of 3 or more are sometimes seen.

The reproductive season is not well-known, but much of the breeding may occur in December and January. The usual litter of 2 pups is born after a gestation period of 60 to 70 days.

Marine otters feed on crabs, shrimps, mollusks, and fish. They sometimes enter rivers to feed on freshwater prawns.

**Exploitation:** This species has been hunted in Chile for fur and because of perceived competition with shellfish fisheries. Although legally protected, there is still some poaching.

**IUCN Status:** Vulnerable.

***Ursus maritimus*** Phipps, 1774

URSI Ursu 1

BPL

FAO Names: En - Polar bear; Fr - Ours blanc; Sp - Oso polar.

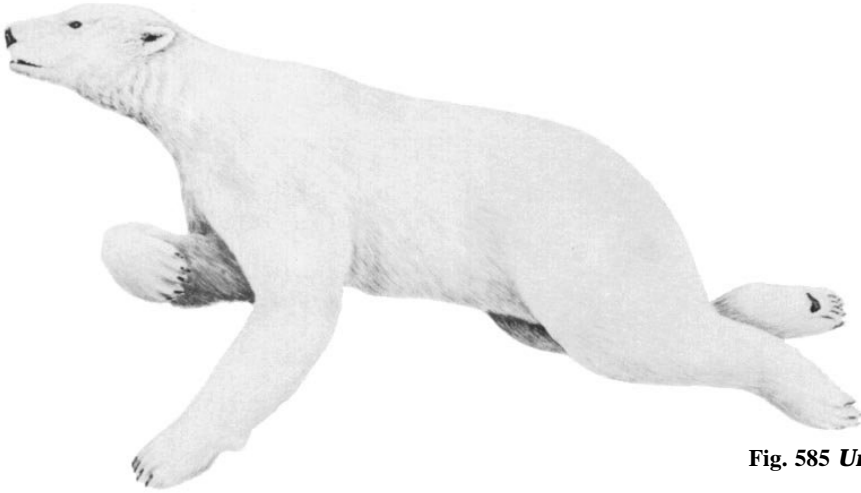
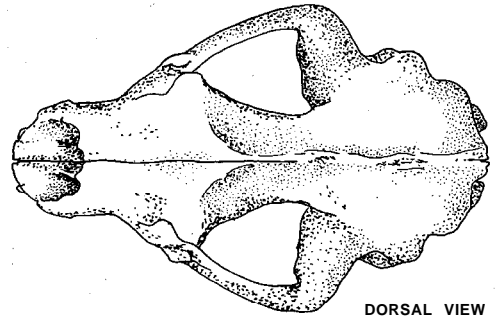


Fig. 585 *Ursus maritimus*

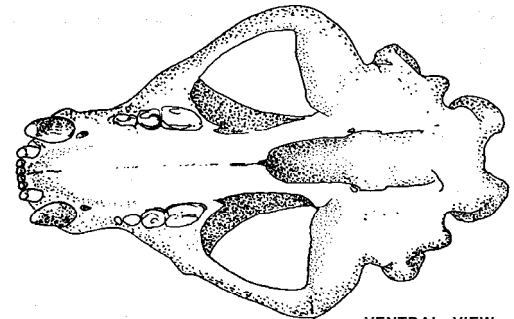
**Distinctive Characteristics:** The polar bear is not substantially different from other bears in body form. It is similar in size to brown and grizzly bears (*Ursus arctos*), but is more slender, and has a long neck and elongated head. The ears are small, an adaptation to the cold. Large partially webbed paws on the front limbs are used for swimming. There are 5 digits on each foot, each with a non-retractable claw. Polar bears are covered with fur on all but the nose and the pads on the bottoms of the feet. The guard hairs overlaying the underfur are up to 15 cm long.

Generally, the pelage of polar bears is white, but (depending on lighting and condition) it can appear yellow, light brown, or light grey. The nose and skin are black.

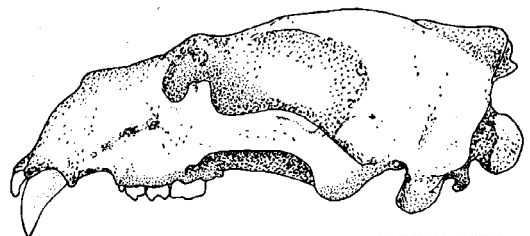
The dental formula is I 3/3, C 1/1, PM 2-4/2-4, M 2/3.



DORSAL VIEW



VENTRAL VIEW



LATERAL VIEW

Fig. 586 Skull

**Can be confused with:** There should be no problem recognizing polar bears. In the few areas where grizzly, brown, or American black (*Ursus americanus*) bears are found within the polar bear's range, the much lighter colour of the polar bear's fur will make it unmistakable. It should be noted that grizzly, brown, and black bears can be seen swimming, with only their heads up. Careful attention to coloration and head shape should eliminate any confusion. Also note, at a distance a bear's head could be confused with that of a pinniped, especially if conditions are sub-optimal for viewing.

**Size:** Males may be up to 250 cm long and weigh 800 kg. Females reach lengths and weights of 200 cm and 300 kg, respectively. At birth, the tiny cubs weigh only about 0.6 kg.

**Geographical Distribution:** Polar bears have a circumpolar distribution in the Northern Hemisphere. Their southern limits fluctuate with the ice cover (they have been recorded as far south as the Pribilof Islands in the Pacific and Newfoundland in the Atlantic). The northernmost record is from around 88°N. Polar bears are generally associated with sea ice, but they have been seen swimming at sea many kilometres away from the nearest land.

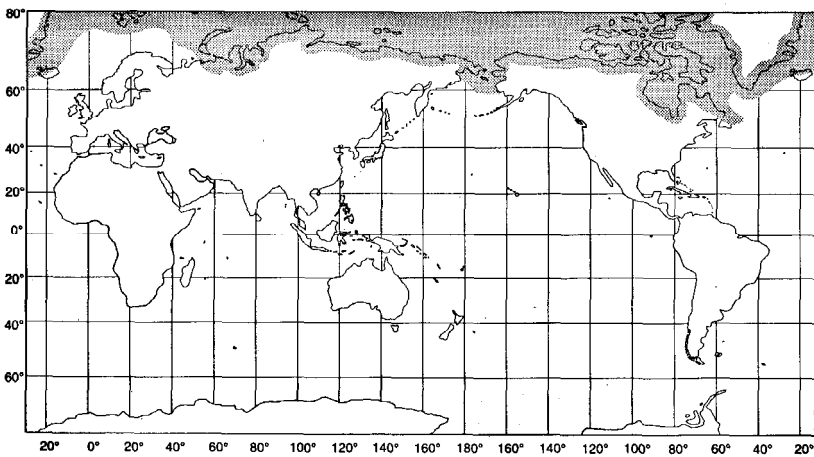


Fig. 587

**Biology and Behaviour:** Polar bears tend to be solitary, but breeding pairs and females with up to 3 cubs may be seen together. They also aggregate in areas of great food concentrations. These bears can swim rather well, using their large webbed paws. They sometimes spend significant periods of time on land.

Mating occurs from April to June. Each male may mate with 1 or several females. In November to December, the pregnant female excavates a den, where the 1 to 3 cubs are born in December and January.

The primary diet of polar bears consists of ringed seals, but they also take bearded, harp, and hooded seals, and rarely walrus and white whales. These bears sometimes eat arctic cod and other forms of animal and vegetable matter.

**Exploitation:** There is a long history of hunting, both commercial and subsistence, of the polar bear, mostly for meat and hides. There is active management in several areas, and most stocks are stable or increasing.

**IUCN Status:** Vulnerable.

# 5. List of Species by Major Marine Fishing Areas

\* extralimital record or possibly sightings; ? uncertain distribution.

| SPECIES                           | PAGE | GEOGRAPHICAL DISTRIBUTION |                            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----------------------------------|------|---------------------------|----------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                                   |      | FRESH-<br>WATERS          | MAJOR MARINE FISHING AREAS |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                   |      |                           | 18                         | 21 | 27 | 31 | 34 | 37 | 41 | 47 | 48 | 51 | 57 | 58 | 61 | 67 | 71 | 77 | 81 | 87 | 88 |
| MYSTACETI                         |      |                           |                            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| <i>Eubalaena glacialis</i>        | 42   |                           | ●                          | ●  | ●  | ●  |    |    |    |    |    |    |    | ●  | ●  |    | ●  |    |    |    |    |
| <i>Eubalaena australis</i>        | 44   |                           |                            |    |    |    |    |    | ●  | ●  | ●  | ●  | ●  | ●  |    |    |    | ●  | ●  |    |    |
| <i>Balaena mysticetus</i>         | 46   |                           | ●                          | ●  | ●  |    |    |    |    |    |    |    |    | ●  | ●  |    |    |    |    |    |    |
| <i>Caperea marginata</i>          | 48   |                           |                            |    |    |    |    |    | ●  | ●  | ●  | ●  | ●  | ●  |    |    |    |    | ●  | ●  |    |
| <i>Balaenoptera musculus</i>      | 50   |                           | ●                          | ●  | ●  | ●  | ●  |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |    |
| <i>Balaenoptera physalus</i>      | 52   |                           | ●                          | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |    |
| <i>Balaenoptera borealis</i>      | 54   |                           |                            | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |    |
| <i>Balaenoptera edeni</i>         | 56   |                           |                            | ●  |    | ●  | ●  |    | ●  | ●  |    | ●  | ●  | ●  |    | ●  | ●  | ●  | ●  |    |    |
| <i>Balaenoptera acutorostrata</i> | 58   |                           | ●                          | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |    |
| <i>Megaptera novaeangliae</i>     | 60   |                           | ●                          | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |    |
| <i>Eschrichtius robustus</i>      | 62   |                           | ●                          |    |    |    |    |    |    |    |    |    |    | ●  | ●  | ●  |    |    |    |    |    |
| ODONTOCETI                        |      |                           |                            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| <i>Physeter catodon</i>           | 68   |                           |                            | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |    |
| <i>Kogia breviceps</i>            | 70   |                           |                            | ●  | ●  | ●  | ●  |    | ●  | ●  |    | ●  | ●  |    | ●  | ●  | ●  | ●  | ●  | ●  |    |
| <i>Kogia simus</i>                | 72   |                           |                            | ●  | ●  | ●  | ●  |    | ●  | ●  |    | ●  | ●  |    | ●  | ●  | ●  | ●  | ●  | ●  |    |
| <i>Monodon monoceros</i>          | 74   |                           | ●                          | ●  | ●  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| <i>Delphinapterus leucas</i>      | 76   |                           | ●                          | ●  | ●  |    |    |    |    |    |    |    |    | ●  | ●  |    |    |    |    |    |    |
| <i>Berardius bairdii</i>          | 78   |                           |                            |    |    |    |    |    |    |    |    |    |    | ●  | ●  |    | ●  |    |    |    |    |
| <i>Berardius arnuxii</i>          | 80   |                           |                            |    |    |    |    |    | ●  | ●  | ●  | ●  | ●  | ●  |    |    |    | ●  | ●  | ●  |    |
| <i>Ziphius cavirostris</i>        | 82   |                           |                            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |    | ●  | ●  |    | ●  | ●  | ●  | ●  | ●  | ●  |    |
| <i>Hyperoodon ampullatus</i>      | 84   |                           |                            | ●  | ●  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| <i>Hyperoodon planifrons</i>      | 86   |                           |                            |    |    |    |    |    | ●  | ●  | ●  | ●  | ●  | ●  |    |    |    |    | ●  | ●  |    |
| <i>Tasmacetus shephendi</i>       | 88   |                           |                            |    |    |    |    |    | ●  | ?  |    | ?  | ●  |    |    |    |    |    | ●  | ●  |    |
| <i>Mesoplodon densirostris</i>    | 90   |                           |                            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |    | ●  | ●  |    | ●  |    | ●  | ●  | ●  | ●  |    |

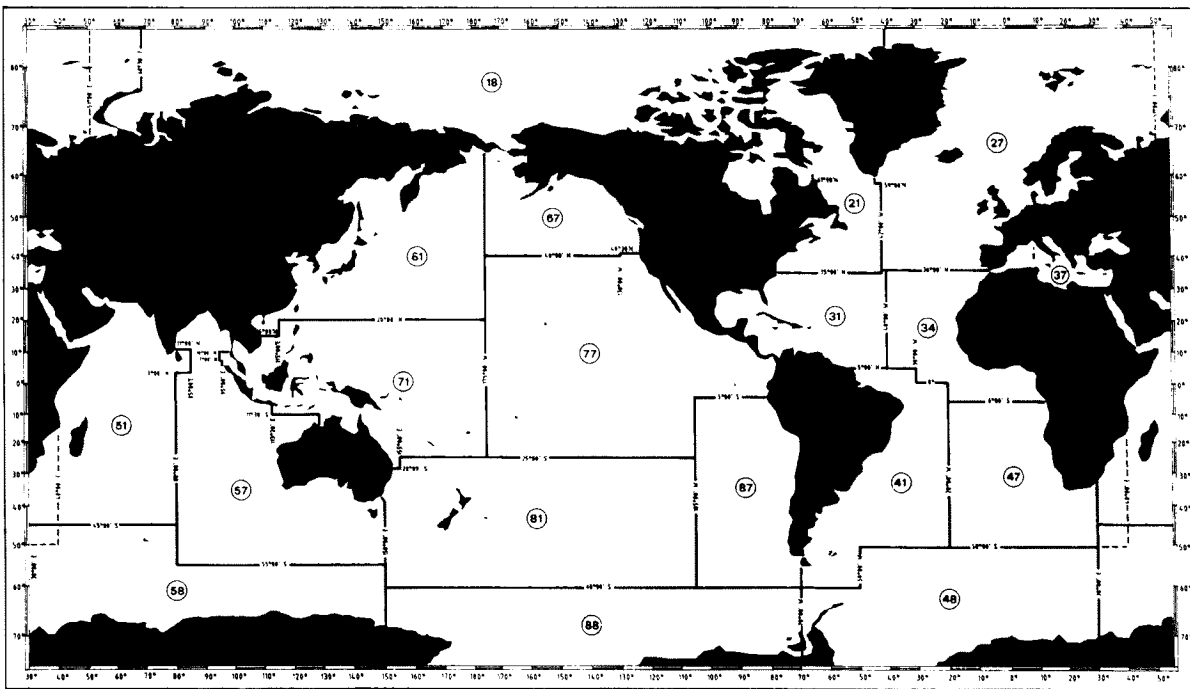
| SPECIES                           | PAGE | GEOGRAPHICAL DISTRIBUTION |                            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----------------------------------|------|---------------------------|----------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                                   |      | FRESH-<br>WATERS          | MAJOR MARINE FISHING AREAS |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                   |      |                           | 18                         | 21 | 27 | 31 | 34 | 37 | 41 | 47 | 48 | 51 | 57 | 58 | 61 | 67 | 71 | 77 | 81 | 87 | 88 |
| <i>Mesoplodon grayi</i>           | 92   |                           |                            |    |    |    |    |    | ●  | ●  | ●  | ●  | ●  | ●  |    |    |    | ★  | ●  | ●  |    |
| <i>Mesoplodon ginkgodens</i>      | 94   |                           |                            |    |    |    |    |    |    |    |    | ●  | ?  |    | ●  |    | ●  | ●  | ●  | ?  |    |
| <i>Mesoplodon hectori</i>         | 96   |                           |                            |    |    |    |    |    | ●  | ●  |    | ?  | ●  |    |    |    |    | ●  | ●  | ●  |    |
| <i>Mesoplodon carlhubbsi</i>      | 98   |                           |                            |    |    |    |    |    |    |    |    |    |    |    | ●  | ●  |    | ●  |    |    |    |
| <i>Mesoplodon peruvianus</i>      | 100  |                           |                            |    |    |    |    |    |    |    |    |    |    |    |    |    |    | ★  |    | ●  |    |
| <i>Mesoplodon bidens</i>          | 102  |                           |                            | ●  | ●  |    | ●  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| <i>Mesoplodon europeaus</i>       | 104  |                           |                            | ●  | ★  | ●  | ★  |    |    | ★  |    |    |    |    |    |    |    |    |    |    |    |
| <i>Mesoplodon mirus</i>           | 106  |                           |                            | ●  | ●  | ●  |    |    |    | ●  |    |    | ●  |    |    |    |    |    |    |    |    |
| <i>Mesoplodon layardii</i>        | 108  |                           |                            |    |    |    |    |    | ●  | ●  | ●  | ●  | ●  | ●  |    |    |    |    | ●  | ●  |    |
| <i>Mesoplodon bowdoini</i>        | 110  |                           |                            |    |    |    |    |    |    |    |    | ●  | ★  |    |    |    |    | ●  |    |    |    |
| <i>Mesoplodon pacificus</i>       | 112  |                           |                            |    |    |    |    |    |    |    |    | ★  |    |    |    |    | ★  |    |    |    |    |
| <i>Mesoplodon stejnegeri</i>      | 114  |                           |                            |    |    |    |    |    |    |    |    |    |    |    | ●  | ●  |    | ●  |    |    |    |
| <i>Mesoplodon</i> sp. "A"         | 116  |                           |                            |    |    |    |    |    |    |    |    |    |    |    |    |    |    | ●  |    | ●  |    |
| <i>Orcaella brevirostris</i>      | 118  | ●                         |                            |    |    |    |    |    |    |    |    |    | ●  |    |    |    | ●  |    |    |    |    |
| <i>Orcinus orca</i>               | 120  |                           | ●                          | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| <i>Globicephala melas</i>         | 122  |                           |                            | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |    |    |    |    | ●  | ●  |    |
| <i>Globicephala macrorhynchus</i> | 124  |                           |                            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |    | ●  | ●  |    | ●  | ●  | ●  | ●  | ●  | ●  |    |
| <i>Pseudorca crassidens</i>       | 126  |                           |                            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |    | ●  | ●  |    | ●  | ●  | ●  | ●  | ●  | ●  |    |
| <i>Feresa attenuata</i>           | 128  |                           |                            |    |    | ●  | ●  | ●  | ●  | ●  |    | ●  | ●  |    | ●  |    | ●  | ●  | ●  | ●  |    |
| <i>Peponocephala electra</i>      | 130  |                           |                            | ●  |    | ●  | ●  |    | ●  | ●  |    | ●  | ●  |    | ●  |    | ●  | ●  | ●  | ●  |    |
| <i>Sotalia fluviatilis</i>        | 132  | ●                         |                            |    |    | ●  |    |    | ●  |    |    |    |    |    |    |    |    |    |    |    |    |
| <i>Sousa chinensis</i>            | 134  |                           |                            |    |    |    |    |    |    | ●  |    | ●  | ●  |    | ●  |    | ●  |    | ●  |    |    |
| <i>Sousa teuszii</i>              | 136  |                           |                            |    |    |    | ●  |    |    | ●  |    |    |    |    |    |    |    |    |    |    |    |
| <i>Steno bredanensis</i>          | 138  |                           |                            |    | ●  | ●  | ●  | ●  | ●  | ●  |    | ●  | ●  |    | ●  | ●  | ●  | ●  | ●  | ●  |    |
| <i>Lagenorhynchus obliquidens</i> | 140  |                           |                            |    |    |    |    |    |    |    |    |    |    |    | ●  | ●  |    | ●  |    |    |    |

| SPECIES                            | PAGE | GEOGRAPHICAL DISTRIBUTION |                            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|------------------------------------|------|---------------------------|----------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                                    |      | FRESH-<br>WATERS          | MAJOR MARINE FISHING AREAS |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                    |      |                           | 18                         | 21 | 27 | 31 | 34 | 37 | 41 | 47 | 48 | 51 | 57 | 58 | 61 | 67 | 71 | 77 | 81 | 87 | 88 |
| <i>Lagenorhynchus obscurus</i>     | 142  |                           |                            |    |    |    |    | ●  | ●  |    | ★  | ★  |    |    |    |    |    | ●  | ●  |    |    |
| <i>Lagenorhynchus albirostris</i>  | 144  |                           | ●                          | ●  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| <i>Lagenorhynchus acutus</i>       | 146  |                           | ●                          | ●  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| <i>Lagenorhynchus cruciger</i>     | 148  |                           |                            |    |    |    |    | ●  | ●  | ●  | ?  | ●  | ●  |    |    |    |    | ●  | ●  | ●  |    |
| <i>Lagenorhynchus australis</i>    | 150  |                           |                            |    |    |    |    | ●  |    |    |    |    |    |    |    |    | ★  |    | ●  |    |    |
| <i>Grampus griseus</i>             | 152  |                           | ●                          | ●  | ●  | ●  |    | ●  | ●  |    | ●  | ●  |    | ●  | ●  | ●  | ●  | ●  | ●  |    |    |
| <i>Tursiops truncatus</i>          | 154  |                           | ●                          | ●  | ●  | ●  | ●  | ●  | ●  |    | ●  | ●  |    | ●  |    | ●  | ●  | ●  | ●  |    |    |
| <i>Stenella attenuata</i>          | 156  |                           | ●                          |    | ●  | ●  |    | ●  | ●  |    | ●  | ●  |    | ●  |    | ●  | ●  | ●  | ●  |    |    |
| <i>Stenella frontalis</i>          | 158  |                           | ●                          | ●  | ●  | ●  |    | ●  | ●  |    |    |    |    |    |    |    |    |    |    |    |    |
| <i>Stenella longirostris</i>       | 160  |                           | ●                          |    | ●  | ●  |    | ●  | ●  |    | ●  | ●  |    | ●  |    | ●  | ●  | ●  | ●  |    |    |
| <i>Stenella clymene</i>            | 162  |                           | ●                          |    | ●  | ●  |    | ●  | ●  |    |    |    |    |    |    |    |    |    |    |    |    |
| <i>Stenella coeruleoalba</i>       | 164  |                           | ●                          | ●  | ●  | ●  | ●  | ●  | ●  |    | ●  | ●  |    | ●  | ●  | ●  | ●  | ●  | ●  |    |    |
| <i>Delphinus delphis</i>           | 166  |                           | ●                          | ●  | ●  | ●  | ●  | ●  | ●  |    | ●  | ●  |    | ●  |    | ●  | ●  | ●  | ●  |    |    |
| <i>Lagenodelphis hosei</i>         | 168  |                           |                            |    | ●  | ●  |    | ●  | ●  |    | ●  | ●  |    | ●  |    | ●  | ●  |    | ●  |    |    |
| <i>Lissodelphis borealis</i>       | 170  |                           |                            |    |    |    |    |    |    |    |    |    |    | ●  | ●  |    | ●  |    |    |    |    |
| <i>Lissodelphis peronii</i>        | 172  |                           |                            |    |    |    |    | ●  | ●  | ●  | ●  | ●  | ●  |    |    |    |    | ●  | ●  | ●  |    |
| <i>Cephalorhynchus commersonii</i> | 174  |                           |                            |    |    |    |    | ●  |    |    |    |    | ●  |    |    |    |    |    | ●  |    |    |
| <i>Cephalorhynchus heavisidii</i>  | 176  |                           |                            |    |    |    |    |    | ●  |    |    |    |    |    |    |    |    |    |    |    |    |
| <i>Cephalorhynchus hectori</i>     | 178  |                           |                            |    |    |    |    |    |    |    |    |    |    |    |    |    |    | ●  |    |    |    |
| <i>Cephalorhynchus eutropia</i>    | 180  |                           |                            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | ●  |    |    |
| <i>Phocoenoides dalli</i>          | 182  |                           |                            |    |    |    |    |    |    |    |    |    |    | ●  | ●  |    | ●  |    |    |    |    |
| <i>Australophocaena dioptrica</i>  | 184  |                           |                            |    |    |    |    | ●  | ?  | ●  |    | ?  | ●  |    |    |    |    | ●  | ●  |    |    |
| <i>Phocoena phocoena</i>           | 186  |                           | ●                          | ●  | ●  |    | ●  | ●  |    |    |    |    |    | ●  | ●  |    | ●  |    |    |    |    |
| <i>Phocoena spinipinnis</i>        | 188  |                           |                            |    |    |    |    | ●  |    |    |    |    |    |    |    |    |    |    | ●  |    |    |
| <i>Phocoena sinus</i>              | 190  |                           |                            |    |    |    |    |    |    |    |    |    |    |    |    |    | ●  |    |    |    |    |

| SPECIES                            | PAGE | GEOGRAPHICAL DISTRIBUTION |                            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|------------------------------------|------|---------------------------|----------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                                    |      | FRESH-<br>WATERS          | MAJOR MARINE FISHING AREAS |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                    |      |                           | 18                         | 21 | 27 | 31 | 34 | 37 | 41 | 47 | 48 | 51 | 57 | 58 | 61 | 67 | 71 | 77 | 81 | 87 | 88 |
| <i>Neophocaena phocaenoides</i>    | 192  | ●                         |                            |    |    |    |    |    |    |    | ●  | ●  |    | ●  |    | ●  |    |    |    |    |    |
| <i>Platanista gangetica</i>        | 194  | ●                         |                            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| <i>Platanista minor</i>            | 196  | ●                         |                            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| <i>Inia geoffrensis</i>            | 198  | ●                         |                            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| <i>Lipotes vexillifer</i>          | 200  | ●                         |                            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| <i>Pontoporia blainvillei</i>      | 202  |                           |                            |    |    |    |    |    | ●  |    |    |    |    |    |    |    |    |    |    |    |    |
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| <i>Trichechus manatus</i>          | 206  | ●                         |                            | ●  |    | ●  |    |    | ●  |    |    |    |    |    |    |    | ★  |    |    |    |    |
| <i>Trichechus senegalensis</i>     | 208  | ●                         |                            |    |    |    | ●  |    |    | ●  |    |    |    |    |    |    |    |    |    |    |    |
| <i>Trichechus inunguis</i>         | 210  | ●                         |                            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| <i>Dugong dugon</i>                | 212  |                           |                            |    |    |    |    |    |    |    | ●  | ●  |    | ●  |    | ●  |    |    |    |    |    |
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| <i>Eumetopias jubatus</i>          | 228  |                           |                            |    |    |    |    |    |    |    |    |    |    | ●  | ●  |    | ●  |    |    |    |    |
| <i>Zalophus californianus</i>      | 230  |                           |                            |    |    |    |    |    |    |    |    |    |    |    | ●  |    | ●  |    | ●  |    |    |
| <i>Otaria byronia</i>              | 232  |                           |                            |    |    |    |    |    | ●  |    |    |    |    |    |    |    |    |    | ●  |    |    |
| <i>Neophoca cinerea</i>            | 234  |                           |                            |    |    |    |    |    |    |    |    | ●  |    |    |    |    |    |    |    |    |    |
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## 7. INDEX OF SCIENTIFIC AND VERNACULAR NAMES

### EXPLANATION OF THE SYSTEM

Type faces used:

*Italics* (bold) : Valid scientific names (double entry by genera and species)

*Italics* : Synonyms (double entry by genera and species)

**Roman** (bold) : International (FAO) species names

Roman : Local species names

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| <i>Enhydra lutris gracilis</i>   | 299     |
| <i>Enhydra lutris lutris</i>     | 299     |
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| <i>eutropia, Cephalorhynchus</i> | 180     |

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| <i>felina, Lutra</i>      | 300                             |
| <i>Feresa attenuata</i>   | 128                             |
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| Finless porpoise          | 118,119,192,193,195,197,201,213 |
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| Foca de Groenlandia       | 268                             |
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| Ganges River dolphin                | 66,193-198                      |
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| <i>gazella, Arctocephalus</i>       | 252                             |
| <i>geoffrensis, Inia</i>            | 198                             |
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| <i>Globicephala melas</i>           | 122,125                         |
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| Gray's beaked whale                 | 90,92,93                        |
| Gray's spinner dolphin              | 160                             |
| <i>grayi, Mesoplodon</i>            | 92                              |
| Grey seal                           | 259,263,269,272,273,275,277,279 |
| <i>griseus, Grampus</i>             | 152                             |
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| <i>groenlandica, Phoca</i>          | 268                             |
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H

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| Heaviside's dolphin                        | 176,177                         |
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| Hector's beaked whale                      | 90,96,97                        |
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| <i>hectori</i> , <i>Mesoplodon</i>         | 96                              |
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| <i>hispida hispida</i> , <i>Phoca</i>      | 363                             |
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| <i>hispida ochotensis</i> , <i>Phoca</i>   | 263                             |
| <i>hispida saimensis</i> , <i>Phoca</i>    | 263                             |
| <i>hispida</i> , <i>Phoca</i>              | 262                             |
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| Hooker's sea lion                          | 236,237,249,263                 |
| <i>hookeri</i> , <i>Phocarcos</i>          | 236                             |
| <i>hosei</i> , <i>Lagenodelphis</i>        | 168                             |
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| Hump-backed dolphin                        | 134-136,155,157,195             |
| Humpback whale                             | 45,60,61,63,69                  |
| Hyena                                      | 297                             |
| <i>Hydrodamalis gigas</i>                  | 205                             |
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| <i>Hyperoodon planifrons</i>               | 86,87                           |
| <i>Hyperoodon sp.</i>                      | 87                              |

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| Indus River dolphin                 | 66,196-198          |
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| <i>Lagenorhynchus australis</i>                       | 150                 |
| <i>Lagenorhynchus cruciger</i>                        | 148                 |
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| Lamantin de l'Amazonie                                | 208                 |
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| Lion de mer de Californie                             | 230                 |
| Lion de mer de Nouvelle-Zélande                       | 236                 |
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| Lobo fino antartico                                   | 252                 |
| Lobo fino austral                                     | 246                 |
| Lobo fino de Australia                                | 254                 |
| Lobo fino de Galapagos                                | 244                 |
| Lobo fino de Guadalupe                                | 240                 |
| Lobo fino de Juan Fernandez                           | 242                 |
| Lobo fino de Nueva Zelandia                           | 248                 |
| Lobo fino de subantarctico                            | 250                 |
| Lobo fino del norte                                   | 238                 |
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| Lobo marino de California                             | 230                 |
| Lobo marino de dos pelos de Sudafrica                 | 254                 |
| Lobo marino de Steller                                | 228                 |
| <i>Lobodon carcinophagus</i>                          | 288                 |
| Long-finned pilot whale                               | 122,123             |
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| <i>longirostris</i> , <i>Stenella longirostris</i>    | 160                 |
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| <i>longirostris longirostris</i> , <i>Stenella</i>    | 160                 |
| <i>longirostris orientalis</i> , <i>Stenella</i>      | 160                 |
| Longman's beaked whale                                | 107,112,113         |
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| <i>macrorhynchus, Globicephala</i>     | 124                                |
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| <i>manatus, Trichechus</i>             | 206                                |
| <i>manatus, Trichechus manatus</i>     | 206                                |
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| <i>maritimus, Ursus</i>                | 302                                |
| <b>Marsopa común</b>                   | 186                                |
| <b>Marsopa de anteojos</b>             | 184                                |
| <b>Marsopa de Dall</b>                 | 182                                |
| <b>Marsopa espinosa</b>                | 188                                |
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| <b>Marsouin aptère</b>                 | 192                                |
| <b>Marsouin commun</b>                 | 186                                |
| <b>Marsouin de Burmeister</b>          | 188                                |
| <b>Marsouin de Dall</b>                | 182                                |
| <b>Marsouin de Lahille</b>             | 184                                |
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| <b>Mediterranean monk seal</b>         | 278-280                            |
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| <i>melaena, Globicephala</i>           | 122                                |
| <i>melas, Globicephala</i>             | 122,125                            |
| <b>Melon-headed whale</b>              | 123-125,127-131                    |
| <i>Mesoplodon</i>                      | 79 81 83,86,87,89-91, 93-95        |
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| <i>Mesoplodon bowdoini</i>             | 110                                |
| <i>Mesoplodon carlhubbsi</i>           | 98                                 |
| <i>Mesoplodon densirostris</i>         | 90                                 |
| <i>Mesoplodon europaeus</i>            | 104                                |
| <i>Mesoplodon ginkgodens</i>           | 94                                 |
| <i>Mesoplodon grayi</i>                | 92                                 |
| <i>Mesoplodon hectori</i>              | 96                                 |
| <i>Mesoplodon layardii</i>             | 108                                |
| <i>Mesoplodon mirus</i>                | 106                                |
| <i>Mesoplodon pacificus</i>            | 112                                |
| <i>Mesoplodon peruvianus</i>           | 100                                |
| <i>Mesoplodon sp.</i>                  | 116                                |
| <i>Mesoplodon species “A”</i>          | 116                                |
| <i>Mesoplodon stejnegeri</i>           | 114                                |
| <b>Mink</b>                            | 297                                |
| <b>Minke whale</b>                     | 49,57-59,79                        |
| <i>minor, Platanista</i>               | 196                                |
| <i>Mirounga angustirostris</i>         | 284                                |
| <i>Mirounga leonina</i>                | 286                                |
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| <i>Monachus tropicalis</i>               | 280     |
| <i>monachus, Monachus</i>                | 278     |
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| <b>Morse</b>                             | 256     |
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| <i>musculus, Balaenoptera</i>            | 50      |
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| <i>Neophoca cinerea</i>             | 234                         |
| <i>Neophocaena phocaenoides</i>     | 192                         |
| <b>New Zealand fur seal</b>         | 235,237,248,249,251,253,255 |
| <b>Northern bottlenose whale</b>    | 84-86                       |
| <b>Northern elephant seal</b>       | 259,283 -285                |
| <b>Northern fur seal</b>            | 231,238,239,241             |
| <b>Northern right whale</b>         | 42,43                       |
| <b>Northern right whale dolphin</b> | 141,170-172                 |
| <i>novaeangliae, Megaptera</i>      | 60                          |
| <b>Nutria de mar</b>                | 300                         |
| <b>Nutria marina</b>                | 298                         |

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| <i>obscurus, Lagenorhynchus</i>          | 142 |
| <b>Ocean dolphin</b>                     | 65  |
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| <i>Odobenus rosmarus divergens</i>       | 257 |
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| <b>Orca falsa</b>                        | 128 |
| <b>Orca pigmea</b>                       | 128 |
| <i>orca, Orcinus</i>                     | 120 |
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| <b>Orcelle</b>                           | 118 |
| <i>Orcinus orca</i>                      | 120 |
| <i>orientalis, Stenella longirostris</i> | 160 |
| <b>Orque</b>                             | 120 |
| <b>Orque pygmée</b>                      | 128 |
| <b>Oso polar</b>                         | 302 |
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| Otarie de Guadalupe        | 240 |
| Otarie de Juan Fernandez   | 242 |
| Otarie de Nouvelle-Zélande | 248 |
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| <i>pacificus</i> , <i>Mesoplodon</i>      | 112                 |
| Pantropical spotted dolphin               | 156,157,159,161,164 |
| Peale's dolphin                           | 143,150,151         |
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| Péponocéphale                             | 130                 |
| <i>peronii</i> , <i>Lissodelphis</i> .    | 172                 |
| <i>peruvianus</i> , <i>Mesoplodon</i>     | 100                 |
| Petit rorqual                             | 58                  |
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| <i>Phoca</i>                              | 272                 |
| <i>Phoca caspica</i>                      | 266                 |
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| <i>Phoca hispida botnica</i>              | 263                 |
| <i>Phoca hispida hispida</i>              | 263                 |
| <i>Phoca hispida lagodensis</i>           | 263                 |
| <i>Phoca hispida ochotensis</i>           | 263                 |
| <i>Phoca hispida saimensis</i>            | 263                 |
| <i>Phoca largha</i>                       | 260                 |
| <i>Phoca sibirica</i>                     | 264                 |
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| <i>Phocoena sinus</i>                     | 190                 |
| <i>Phocoena spinipinnis</i>               | 188                 |
| <i>phocoena</i> , <i>Phocoena</i>         | 186                 |
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| Phoque de la Mer Caspienne                       | 266              |
| Phoque de Ross                                   | 290              |
| Phoque de Weddell                                | 294              |
| Phoque du Groenland                              | 268              |
| Phoque du lac Baikal                             | 264              |
| Phoque gris                                      | 272              |
| Phoque moine de Hawai                            | 282              |
| Phoque moine de la Méditerranée                  | 278              |
| Phoque moine des Caraïbes                        | 280              |
| Phoque veau marin                                | 258              |
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| Platanista del Indus                             | 196              |
| Platanista del Yangtze                           | 200              |
| <i>Platanista gangetica</i>                      | 194,196          |
| <i>Platanista minor</i>                          | 196              |
| Plataniste de l'Indus                            | 196              |
| Plataniste du Gange                              | 194              |
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| <i>Pontoporia blainvillei</i>                    | 202              |
| PONTOPORIIDAE                                    | 67               |
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| <i>provocax</i> , <i>Lutra</i>                   | 301              |
| <i>Pseudorca crassidens</i>                      | 126              |
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| <i>pusillus</i> , <i>Arctocephalus</i>           | 254              |
| Pygmy beaked whale                               | 100,101          |
| Pygmy blue whale                                 | 50               |
| Pygmy killer whale                               | 123 -125,127-131 |
| Pygmy right whale                                | 40,48,49         |
| Pygmy sperm whale                                | 64,70-73         |

R

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| Racoon                                | 297                         |
| Ribbon seal                           | 261,263,270,271,275         |
| Right whale                           | 40                          |
| Right whale                           | 42-44,47,48,63              |
| Right whale dolphin                   | 170-172                     |
| Ringed seal                           | 261-267,269,271,273,275,277 |
| Risso's dolphin                       | 120,125,141,152,153,155     |
| River dolphin                         | 66, 194-196                 |
| River otter                           | 299,301                     |
| <i>robustus</i> , <i>Eschrichtius</i> | 62                          |
| Rorqual                               | 40,51                       |

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| Rorqual bleu                        | 50              |
| Rorcual común                       | 52              |
| Rorcual del norte                   | 54              |
| Rorcual enano                       | 58              |
| Rorcual jorobado                    | 80              |
| Rorcual tropical                    | 56              |
| Rorqual bleu                        | 50              |
| Rorqual commun                      | 52              |
| Rorqual de Bryde                    | 56              |
| Rorqual de Rudolphi                 | 54              |
| <i>rosmarus divergens, Odobenus</i> | 257             |
| <i>rosmarus laptevi, Odobenus</i>   | 257             |
| <i>rosmarus rosmarus, Odobenus</i>  | 257             |
| <i>rosmarus, Odobenus</i>           | 256             |
| Ross seal                           | 287,290,291,295 |
| <i>rossii, Ommatophoca</i>          | 290             |
| Rough-toothed dolphin               | 138,139,155     |

S

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| <i>schauinslandi, Monachus</i>  | 282                              |
| Sea lion                        | 214,228-236                      |
| Sea otter                       | 297-299                          |
| Seal                            | 214                              |
| Sei whale                       | 50,51,53-57,59                   |
| <i>senegalensis, Trichechus</i> | 210                              |
| Shepherd's beaked whale         | 88,89                            |
| <i>shepherdi, Tasmacetus</i>    | 88                               |
| Short-finned pilot whale        | 122-125                          |
| <i>sibirica, Phoca</i>          | 264                              |
| <i>simus, Kogia</i>             | 72                               |
| <i>sinus, Phocoena</i>          | 190                              |
| SIRENIA                         | 204,205                          |
| Skunk                           | 297                              |
| Sotalia                         | 132                              |
| <i>Sotalia</i>                  | 65,132,133, 155,199,203          |
| <i>Sotalia fluviatilis</i>      | 132                              |
| <i>Sousa chinensis</i>          | 134                              |
| <i>Sousa teuszii</i>            | 136                              |
| South African fur seal          | 251.253-255                      |
| South American fur seal         | 189,233,243,246, 247,251,253     |
| South American sea lion         | 189,231-233, 243,245,247,251,253 |
| Southern bottlenose whale       | 81,86,87                         |
| Southern elephant seal          | 286,287,291,295                  |
| Southern right whale            | 44,45                            |
| Southern right whale dolphin    | 172,173                          |
| Sowerby's beaked whale          | 90,102,103                       |
| Spectacled porpoise             | 175,184,185,189                  |
| Sperm whale                     | 61,63,64,68,89,125               |
| <i>spinipinnis, Phocoena</i>    | 188                              |
| Spinner dolphin                 | 157,160-165                      |
| Spotted dolphin                 | 156-158,165                      |
| Spotters                        | 156                              |
| Stejneger's beaked whale        | 90,114,115                       |
| <i>stejnegeri, Mesoplodon</i>   | 114                              |
| Steller sea lion                | 228,229,231,239,241              |

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| Steller's sea cow                            | 204,205                          |
| <i>Stenella</i>                              | 164,165                          |
| <i>Stenella attenuata</i>                    | 156                              |
| <i>Stenella clymene</i>                      | 162                              |
| <i>Stenella</i>                              | 164                              |
| <i>Stenella frontalis</i>                    | 158                              |
| <i>Stenella longirostris</i>                 | 160                              |
| <i>Stenella longirostris centroamericana</i> | 160                              |
| <i>Stenella longirostris longirostris</i>    | 160                              |
| <i>Stenella longirostris orientalis</i>      | 160                              |
| Sténo  | 138                              |
| <i>Steno bredanensis</i>                     | 138                              |
| Strap-toothed whale                          | 90,105,108,109                   |
| Streaker                                     | 165                              |
| Striped dolphin                              | 164, 165,169                     |
| Subantarctic fur seal                        | 233,237,243,247, 249-251,253,255 |
| Sulphur-bottom whale                         | 50                               |
| Susu   | 194                              |

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| Tasmacète                             | 88             |
| <i>Tasmacetus shepherdi</i>           | 88             |
| <i>teuszii, Sousa</i>                 | 136            |
| Tonina overa                          | 174            |
| Toothed whale                         | 64             |
| <i>townsendi, Arctocephalus</i>       | 240            |
| TRICHECHIDAE                          | 205            |
| <i>Trichechus inunguis</i>            | 208            |
| <i>Trichechus manatus</i>             | 206            |
| <i>Trichechus manatus latirostris</i> | 207            |
| <i>Trichechus manatus manatus</i>     | 207            |
| <i>Trichechus senegalensis</i>        | 210            |
| <i>tropicalis, Arctocephalus</i>      | 250            |
| <i>tropicalis, Monachus</i>           | 280            |
| True's beaked whale                   | 90,108,107,113 |
| <i>truncatus, Tursiops</i>            | 154            |
| Tucuxi                                | 132,133        |
| Tursion                               | 154            |
| <i>Tursiops truncatus</i>             | 154            |
| True-seal                             | 227            |

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| URSIDAE                     | 297 |
| <i>ursinus, Callorhinus</i> | 238 |
| <i>Ursus americanus</i>     | 303 |
| <i>Ursus arctos</i>         | 302 |
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| Vaca marina del Africa | 210 |
| Vaca marina del Amazon | 208 |
| Vaca marina del Caribe | 206 |

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| <b>Vaquita</b>                           | <b>190,191</b> |
| <b>Veau marin du Pacifique</b>           | <b>260</b>     |
| <i>vexillifer</i> , <i>Lipotes</i>       | <b>200</b>     |
| <i>vitulina concolor</i> , <i>Phoca</i>  | <b>259</b>     |
| <i>vitulina richardsi</i> , <i>Phoca</i> | <b>259</b>     |
| <i>vitulina stejnegeri</i> <i>Phoca</i>  | <b>259</b>     |
| <i>vitulina vitulina</i> , <i>Phoca</i>  | <b>259</b>     |
| <i>vitulina</i> , <i>Phoca</i>           | <b>258</b>     |

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| <b>Walrus</b>                          | <b>226,256,257</b>         |
| <b>Weasel</b>                          | <b>297</b>                 |
| <b>Weddell seal</b>                    | <b>287,289,291,293-295</b> |
| <i>weddelli</i> , <i>Leptonychotes</i> | <b>294</b>                 |
| <b>West African manatee</b>            | <b>210,211</b>             |
| <b>West Indian manatee</b>             | <b>206,207,209,210</b>     |
| <b>West Indian monk seal</b>           | <b>280,281</b>             |
| <b>White whale</b>                     | <b>65,75-77,192</b>        |
| <b>White-beaked dolphin</b>            | <b>144,145,147</b>         |
| White-sided dolphin                    | <b>140, 146</b>            |
| <b>Whitebelly spinner dolphin</b>      | <b>160,161</b>             |
| Wolverine                              | <b>297</b>                 |

Z

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| <i>Zalophus californianus</i>               | <b>230,231</b> |
| <i>Zalophus californianus californianus</i> | <b>230,231</b> |
| <i>Zalophus californianus japonicus</i>     | <b>230,231</b> |
| <i>Zalophus californianus wolfebaeki</i>    | <b>230,231</b> |
| <b>Zifio de Andrews</b>                     | <b>110</b>     |
| <b>Zifio de Baird</b>                       | <b>78</b>      |
| <b>Zifio de Blainville</b>                  | <b>90</b>      |
| <b>Zifio de Cuvier</b>                      | <b>82</b>      |
| <b>Zifio de Gervais</b>                     | <b>104</b>     |
| <b>Zifio de Gray</b>                        | <b>92</b>      |
| <b>Zifio de Hector</b>                      | <b>96</b>      |
| <b>Zifio de Hubbs</b>                       | <b>98</b>      |
| <b>Zifio de Layard</b>                      | <b>108</b>     |
| <b>Zifio de Longman</b>                     | <b>112</b>     |
| <b>Zifio de Sowerby</b>                     | <b>102</b>     |
| <b>Zifio de Stejneger</b>                   | <b>114</b>     |
| <b>Zifio de True</b>                        | <b>106</b>     |
| <b>Zifio Japonés</b>                        | <b>94</b>      |
| ZIPHIIDAE                                   | <b>65</b>      |
| <b>Ziphius</b>                              | <b>82</b>      |
| <i>Ziphius cavirostris</i>                  | <b>82</b>      |